

FILE 'REGISTRY' ENTERED AT 13:41:50 ON 02 MAY 2003  
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COST IN U.S. DOLLARS

|                     | SINCE FILE ENTRY | TOTAL SESSION |
|---------------------|------------------|---------------|
| FULL ESTIMATED COST | 25.46            | 25.67         |

=> file reg

COST IN U.S. DOLLARS

|                     | SINCE FILE ENTRY | TOTAL SESSION |
|---------------------|------------------|---------------|
| FULL ESTIMATED COST | 25.46            | 25.67         |

FILE 'REGISTRY' ENTERED AT 13:41:57 ON 02 MAY 2003  
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STRUCTURE FILE UPDATES: 30 APR 2003 HIGHEST RN 508165-25-1  
DICTIONARY FILE UPDATES: 30 APR 2003 HIGHEST RN 508165-25-1

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 6, 2003

Please note that search-term pricing does apply when conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. See HELP PROPERTIES for more information. See STNnote 27, Searching Properties in the CAS Registry File, for complete details:  
<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

=> s (0.01-0.799)/Li and (0.01-1)/Mn and (0.01-1)/Cr and 2/O

8852 (0.01-0.799)/LI  
388996 (0.01-1)/MN  
348940 (0.01-1)/CR  
4103995 2/O

L2 6 (0.01-0.799)/LI AND (0.01-1)/MN AND (0.01-1)/CR AND 2/O

=> d l2 1-6 kwic ibib

L2 ANSWER 1 OF 6 REGISTRY COPYRIGHT 2003 ACS

MF Cr . Li . Mn . O

AF Cr0.5 Li0.67 Mn0.5 O2

REFERENCE 1

ACCESSION NUMBER: 137:65734 CA  
TITLE: Anode carbon material and its manufacture for secondary nonaqueous-solvent battery  
INVENTOR(S): Uemura, Ryuzo; Osawa, Yasuhiko  
PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.    | KIND | DATE     | APPLICATION NO. | DATE     |
|---------------|------|----------|-----------------|----------|
| JP 2002190301 | A2   | 20020705 | JP 2000-389236  | 20001221 |

PRIORITY APPLN. INFO.:

JP 2000-389236 20001221

L2 ANSWER 2 OF 6 REGISTRY COPYRIGHT 2003 ACS

MF Al . Co . Cr . Li . Mn . O

AF Al0.1 Co0.2 Cr0.2 Li0.75 Mn0.5 O2

REFERENCE 1

ACCESSION NUMBER: 136:186642 CA  
 TITLE: Cathode active material for rechargeable lithium-ion battery  
 INVENTOR(S): Ogawa, Tomaru; Takahashi, Hidekazu; Katamura, Junji; Munakata, Fumio  
 PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan  
 SOURCE: Eur. Pat. Appl., 23 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| EP 1180810  | A2   | 20020220 | EP 2001-119329  | 20010810 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO |      |          |                 |          |
| JP 2002060223   | A2   | 20020226 | JP 2000-248962  | 20000818 |
| JP 2002063903   | A2   | 20020228 | JP 2000-248961  | 20000818 |
| US 2002022183   | A1   | 20020221 | US 2001-929359  | 20010815 |
| PRIORITY APPLN. INFO.:  |      |          | JP 2000-248961  | 20000818 |
|   |      |          | JP 2000-248962  | 20000818 |

L2 ANSWER 3 OF 6 REGISTRY COPYRIGHT 2003 ACS

MF Al . Cr . Li . Mn . O

AF Al0.1 Cr0.4 Li0.75 Mn0.5 O2

REFERENCE 1

ACCESSION NUMBER: 136:186642 CA  
 TITLE: Cathode active material for rechargeable lithium-ion battery  
 INVENTOR(S): Ogawa, Tomaru; Takahashi, Hidekazu; Katamura, Junji; Munakata, Fumio  
 PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan  
 SOURCE: Eur. Pat. Appl., 23 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| EP 1180810  | A2   | 20020220 | EP 2001-119329  | 20010810 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO |      |          |                 |          |
| JP 2002060223   | A2   | 20020226 | JP 2000-248962  | 20000818 |
| JP 2002063903   | A2   | 20020228 | JP 2000-248961  | 20000818 |
| US 2002022183   | A1   | 20020221 | US 2001-929359  | 20010815 |
| PRIORITY APPLN. INFO.:  |      |          | JP 2000-248961  | 20000818 |
|   |      |          | JP 2000-248962  | 20000818 |

L2 ANSWER 4 OF 6 REGISTRY COPYRIGHT 2003 ACS

MF Co . Cr . Li . Mn . O

AF Co0.34 Cr0.34 Li0.75 Mn0.33 O2

REFERENCE 1

ACCESSION NUMBER: 136:186642 CA  
TITLE: Cathode active material for rechargeable lithium-ion battery  
INVENTOR(S): Ogawa, Tomaru; Takahashi, Hidekazu; Katamura, Junji; Munakata, Fumio  
PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan  
SOURCE: Eur. Pat. Appl., 23 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| EP 1180810  | A2   | 20020220 | EP 2001-119329  | 20010810 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO |      |          |                 |          |
| JP 2002060223   | A2   | 20020226 | JP 2000-248962  | 20000818 |
| JP 2002063903   | A2   | 20020228 | JP 2000-248961  | 20000818 |
| US 2002022183   | A1   | 20020221 | US 2001-929359  | 20010815 |
| PRIORITY APPLN. INFO.:  |      |          | JP 2000-248961  | 20000818 |
|   |      |          | JP 2000-248962  | 20000818 |

L2 ANSWER 5 OF 6 REGISTRY COPYRIGHT 2003 ACS  
MF Cr . Li . Mn . O  
AF Cr0.33 Li0.75 Mn0.67 O2

REFERENCE 1

ACCESSION NUMBER: 136:186642 CA  
TITLE: Cathode active material for rechargeable lithium-ion battery  
INVENTOR(S): Ogawa, Tomaru; Takahashi, Hidekazu; Katamura, Junji; Munakata, Fumio  
PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan  
SOURCE: Eur. Pat. Appl., 23 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| EP 1180810  | A2   | 20020220 | EP 2001-119329  | 20010810 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO |      |          |                 |          |
| JP 2002060223   | A2   | 20020226 | JP 2000-248962  | 20000818 |
| JP 2002063903   | A2   | 20020228 | JP 2000-248961  | 20000818 |
| US 2002022183   | A1   | 20020221 | US 2001-929359  | 20010815 |
| PRIORITY APPLN. INFO.:  |      |          | JP 2000-248961  | 20000818 |
|   |      |          | JP 2000-248962  | 20000818 |

L2 ANSWER 6 OF 6 REGISTRY COPYRIGHT 2003 ACS  
MF Cr . Li . Mn . O  
AF Cr0-0.4 Li0.5-1.3 Mn0.6-1 O1.5-2.5

REFERENCE 1

ACCESSION NUMBER: 134:74026 CA  
TITLE: Layered lithium manganese oxide bronze and electrodes thereof  
INVENTOR(S): Dahn, Jeffrey R.; Paulsen, Jens M.  
PATENT ASSIGNEE(S): Chemetals Technology Corporation, USA  
SOURCE: U.S., 16 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.             | KIND | DATE  | APPLICATION NO. | DATE     |
|------------------------|------|---|-----------------|----------|
| US 6168887             | B1   | 20010102  | US 1999-231636  | 19990115 |
| PRIORITY APPLN. INFO.: |      |   | US 1999-231636  | 19990115 |
| REFERENCE COUNT:       | 20   | THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT |                 |          |

=> file caplus  
COST IN U.S. DOLLARS

| SINCE FILE | TOTAL   |
|------------|---------|
| ENTRY      | SESSION |
| 29.62      | 55.29   |

FULL ESTIMATED COST  
FILE 'CAPLUS' ENTERED AT 13:44:52 ON 02 MAY 2003  
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FILE COVERS 1907 - 2 May 2003 VOL 138 ISS 19  
FILE LAST UPDATED: 1 May 2003 (20030501/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s l2  
L3 3 L2

=> d l3 1-3 ibib

L3 ANSWER 1 OF 3 CAPLUS COPYRIGHT 2003 ACS  
ACCESSION NUMBER: 2002:503996 CAPLUS  
DOCUMENT NUMBER: 137:65734  
TITLE: Anode carbon material and its manufacture for secondary nonaqueous-solvent battery  
INVENTOR(S): Uemura, Ryuzo; Osawa, Yasuhiko  
PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.             | KIND | DATE     | APPLICATION NO. | DATE     |
|------------------------|------|----------|-----------------|----------|
| JP 2002190301          | A2   | 20020705 | JP 2000-389236  | 20001221 |
| PRIORITY APPLN. INFO.: |      |          | JP 2000-389236  | 20001221 |

L3 ANSWER 2 OF 3 CAPLUS COPYRIGHT 2003 ACS  
ACCESSION NUMBER: 2002:138997 CAPLUS  
DOCUMENT NUMBER: 136:186642  
TITLE: Cathode active material for rechargeable lithium-ion battery  
INVENTOR(S): Ogawa, Tomaru; Takahashi, Hidekazu; Katamura, Junji; Munakata, Fumio  
PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan  
SOURCE: Eur. Pat. Appl., 23 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO.  | DATE     |
|---|------|----------|------------------|----------|
| EP 1180810  | A2   | 20020220 | EP 2001-119329   | 20010810 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO |      |          |                  |          |
| JP 2002060223   | A2   | 20020226 | JP 2000-248962   | 20000818 |
| JP 2002063903   | A2   | 20020228 | JP 2000-248961   | 20000818 |
| US 2002022183   | A1   | 20020221 | US 2001-929359   | 20010815 |
| PRIORITY APPLN. INFO.:  |      |          | JP 2000-248961 A | 20000818 |
|   |      |          | JP 2000-248962 A | 20000818 |

L3 ANSWER 3 OF 3 CAPLUS COPYRIGHT 2003 ACS  
ACCESSION NUMBER: 2001:7553 CAPLUS  
DOCUMENT NUMBER: 134:74026  
TITLE: Layered lithium manganese oxide bronze and electrodes thereof  
INVENTOR(S): Dahn, Jeffrey R.; Paulsen, Jens M.  
PATENT ASSIGNEE(S): Chemetals Technology Corporation, USA  
SOURCE: U.S., 16 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.             | KIND | DATE     | APPLICATION NO.   | DATE     |
|------------------------|------|----------|---|----------|
| US 6168887             | B1   | 20010102 | US 1999-231636  | 19990115 |
| PRIORITY APPLN. INFO.: |      |          | US 1999-231636  | 19990115 |
| REFERENCE COUNT:       |      | 20       | THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT |          |

=> file reg

COST IN U.S. DOLLARS

FULL ESTIMATED COST

| SINCE FILE ENTRY | TOTAL SESSION |
|------------------|---------------|
| 3.44             | 58.73         |

FILE 'REGISTRY' ENTERED AT 13:45:30 ON 02 MAY 2003  
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STRUCTURE FILE UPDATES: 30 APR 2003 HIGHEST RN 508165-25-1  
DICTIONARY FILE UPDATES: 30 APR 2003 HIGHEST RN 508165-25-1

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 6, 2003

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<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

```
=> s (0.01-0.799)/Li and (0.01-1)/Mn and (0.01-1)/Fe and 2/O
      8852 (0.01-0.799)/LI
      388996 (0.01-1)/MN
      645829 (0.01-1)/FE
      4103995 2/O
L4      58 (0.01-0.799)/LI AND (0.01-1)/MN AND (0.01-1)/FE AND 2/O
```

```
=> s (0.01-0.799)/Li and (0.01-1)/Mn and (0.01-1)/Ni and 2/O
      8852 (0.01-0.799)/LI
      388996 (0.01-1)/MN
      407633 (0.01-1)/NI
      4103995 2/O
L5      138 (0.01-0.799)/LI AND (0.01-1)/MN AND (0.01-1)/NI AND 2/O
```

```
=> file caplus
COST IN U.S. DOLLARS          SINCE FILE          TOTAL
                               ENTRY          SESSION
FULL ESTIMATED COST          34.16          92.89
```

FILE 'CAPLUS' ENTERED AT 13:46:02 ON 02 MAY 2003  
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FILE COVERS 1907 - 2 May 2003 VOL 138 ISS 19  
FILE LAST UPDATED: 1 May 2003 (20030501/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

```
=> s l4
L6      16 L4
```

=> s 15

L7 41 L5

=> s 16 or 17

L8 46 L6 OR L7

=> s 18 and electrode

374821 ELECTRODE

L9 18 L8 AND ELECTRODE

=> d 19 ibib

L9 ANSWER 1 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:831547 CAPLUS

DOCUMENT NUMBER: 138:290297

TITLE: Synthesis and electrochemical performance of layered  
Li[Li(1-2x)/3Ni<sub>x</sub>Mn(2-x)/3]O<sub>2</sub> cathode materials for  
lithium secondary batteries

AUTHOR(S): Sun, Y-K.; Shin, S-S.; Oh, I-H.

CORPORATE SOURCE: Department of Chemical Engineering, Hanyang  
University, Seoul, 133-791, S. Korea

SOURCE: Journal of Applied Electrochemistry (2002), 32(9),  
1053-1056

CODEN: JAELEBJ; ISSN: 0021-891X

PUBLISHER: Kluwer Academic Publishers

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d 19 1-18 ibib kwic

L9 ANSWER 1 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:831547 CAPLUS

DOCUMENT NUMBER: 138:290297

TITLE: Synthesis and electrochemical performance of layered  
Li[Li(1-2x)/3Ni<sub>x</sub>Mn(2-x)/3]O<sub>2</sub> cathode materials for  
lithium secondary batteries

AUTHOR(S): Sun, Y-K.; Shin, S-S.; Oh, I-H.

CORPORATE SOURCE: Department of Chemical Engineering, Hanyang  
University, Seoul, 133-791, S. Korea

SOURCE: Journal of Applied Electrochemistry (2002), 32(9),  
1053-1056

CODEN: JAELEBJ; ISSN: 0021-891X

PUBLISHER: Kluwer Academic Publishers

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AB Layered Li[Li(1-2x)/3Ni<sub>x</sub>Mn(2-x)/3]O<sub>2</sub> (x = 0.35, 0.305, and 0.23) powders  
with high homogeneity and crystallinity have been synthesized using a  
sol-gel method. The layered structure solid solns. were obtained by Ni  
substitution for Li and Mn in Li<sub>2</sub>MnO<sub>3</sub>. The discharge capacity of the  
Li[Li(1-2x)/3Ni<sub>x</sub>Mn(2-x)/3]O<sub>2</sub> **electrode** increased with a decrease  
in Ni concn. The Li[Li<sub>0.18</sub>Ni<sub>0.23</sub>Mn<sub>0.59</sub>]O<sub>2</sub> **electrode** delivers a  
very high capacity of 200 mA h g<sup>-1</sup> with excellent cyclability. Although  
the unusual capacity behavior is not yet revealed, the oxygen valence may  
also play an important role for charge compensation in  
Li[Li(1-2x)/3Ni<sub>x</sub>Mn(2-x)/3]O<sub>2</sub> materials.

IT 505069-59-0P, Lithium manganese nickel oxide (Li<sub>0.1</sub>Mn<sub>0.55</sub>Ni<sub>0.35</sub>O<sub>2</sub>)

505069-60-3P, Lithium manganese nickel oxide (Li<sub>0.13</sub>Mn<sub>0.56</sub>Ni<sub>0.302</sub>)

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or

engineered material use); PREP (Preparation); USES (Uses)  
(lithium battery cathode; synthesis and electrochem. performance of  
layered  $\text{Li}[\text{Li}(1-2x)/3\text{Ni}_x\text{Mn}(2-x)/3]\text{O}_2$  cathode materials for lithium  
secondary batteries)

IT 505069-61-4P, Lithium manganese nickel oxide  
( $\text{Li}_{0.18}\text{Mn}_{0.59}\text{Ni}_{0.23}\text{O}_2$ )

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or  
engineered material use); PREP (Preparation); USES (Uses)  
(synthesis and electrochem. performance of layered  $\text{Li}[\text{Li}(1-2x)/3\text{Ni}_x\text{Mn}(2-x)/3]\text{O}_2$  cathode materials for lithium secondary batteries)

L9 ANSWER 2 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:604603 CAPLUS

DOCUMENT NUMBER: 138:26788

TITLE: Synthesis and Electrochemical Characteristics of  
 $\text{Li}_{0.7}[\text{Ni}_{1/6}\text{Mn}_{5/6}]\text{O}_2$  Cathode Materials

AUTHOR(S): Park, K. S.; Park, S. H.; Sun, Y-K.; Nahm, K. S.;

Yoon, C. S.; Kim, C. K.; Lee, Yun Sung; Yoshio, Masaki  
CORPORATE SOURCE: College of Engineering, School of Chemical Engineering  
and Technology, Chonbuk National University, Jeonju,  
561-756, S. Korea

SOURCE: Journal of the Electrochemical Society (2002), 149(9),  
A1250-A1254

CODEN: JESOAN; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AB  $\text{Li}_{0.7}[\text{Ni}_{1/6}\text{Mn}_{5/6}]\text{O}_2$  powders were prepd. by ion exchange of Li for Na in  
 $\text{Na}_{2/3}[\text{Li}_{1/6}\text{Mn}_{5/6}]\text{O}_2$  precursor, synthesized by a sol-gel method using  
glycolic acid as a chelating agent. The material delivers 180 mA-h/g and  
has excellent cyclability, retaining 98% (0.0486 mA-h/g.cntdot.cycle) of  
the initial capacity after 50 cycles. The electrochem. behavior and  
structural transformation of a  $\text{Li}_{0.7}[\text{Ni}_{1/6}\text{Mn}_{5/6}]\text{O}_2$  electrode  
after cycling was studied using x-ray diffraction, TEM, and cyclic  
voltammetry (CV). Both charge/discharge and CV curves indicate that the  
 $\text{Li}_{0.7}[\text{Ni}_{1/6}\text{Mn}_{5/6}]\text{O}_2$  powder has unique electrochem. properties that differ  
from those of the layered or spinel Li-Mn-O phases. Examn. of the powder  
structure using TEM revealed that the as-prepd. powder consists of a new  
type of defective spinel structure with a high d. of planar faults along a  
particular crystallog. direction, which appears to be removed by  
electrochem. cycling.

IT 462114-56-3, Lithium manganese nickel oxide ( $\text{Li}_{0.7}\text{Mn}_{0.83}\text{Ni}_{0.17}\text{O}_2$ )

RL: CPS (Chemical process); DEV (Device component use); PEP (Physical,  
engineering or chemical process); TEM (Technical or engineered material  
use); PROC (Process); USES (Uses)

(synthesis and electrochem. characteristics of  $\text{Li}_{0.7}[\text{Ni}_{1/6}\text{Mn}_{5/6}]\text{O}_2$   
cathode materials)

L9 ANSWER 3 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:560704 CAPLUS

DOCUMENT NUMBER: 137:386978

TITLE: T2 and O2  $\text{Li}_{2/3}[\text{Co}_x\text{Ni}_{1/3-x}/2\text{Mn}_{2/3-x}/2]\text{O}_2$   
Electrode Materials

AUTHOR(S): Lu, Zhonghua; Donaberger, R. A.; Thomas, C. L.; Dahn,  
J. R.

CORPORATE SOURCE: Department of Physics, Dalhousie University, Halifax,  
NS, B3H 3J5, Can.

SOURCE: Journal of the Electrochemical Society (2002), 149(8),  
A1083-A1091

CODEN: JESOAN; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal



LANGUAGE: English  
REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI T2 and O2  $\text{Li}_{2/3}[\text{Co}_x\text{Ni}_{1/3-x}\text{Mn}_{2/3-x}\text{O}_2]$  **Electrode Materials**  
IT Battery cathodes  
(structure and electrochem. properties of T2 and O2  
 $\text{Li}_{2/3}[\text{Co}_x\text{Ni}_{1/3-x}\text{Mn}_{2/3-x}\text{O}_2]$  **electrode materials**)  
IT 285978-95-2, Manganese nickel sodium oxide ( $\text{Mn}_{0.67}\text{Ni}_{0.33}\text{Na}_{0.67}\text{O}_2$ )  
476301-46-9, Cobalt manganese nickel sodium oxide  
( $\text{Co}_{0.08}\text{Mn}_{0.63}\text{Ni}_{0.29}\text{Na}_{0.67}\text{O}_2$ ) 476301-47-0, Cobalt manganese nickel sodium  
oxide ( $\text{Co}_{0.12}\text{Mn}_{0.6}\text{Ni}_{0.27}\text{Na}_{0.67}\text{O}_2$ ) 476301-48-1, Cobalt manganese nickel  
sodium oxide ( $\text{Co}_{0.17}\text{Mn}_{0.58}\text{Ni}_{0.25}\text{Na}_{0.67}\text{O}_2$ ) 476301-49-2, Cobalt manganese  
nickel sodium oxide ( $\text{Co}_{0.25}\text{Mn}_{0.54}\text{Ni}_{0.21}\text{Na}_{0.67}\text{O}_2$ ) 476301-50-5, Cobalt  
manganese nickel sodium oxide ( $\text{Co}_{0.33}\text{Mn}_{0.5}\text{Ni}_{0.17}\text{Na}_{0.67}\text{O}_2$ ) 476301-51-6,  
Cobalt manganese nickel sodium oxide ( $\text{Co}_{0.42}\text{Mn}_{0.46}\text{Ni}_{0.12}\text{Na}_{0.67}\text{O}_2$ )  
476301-52-7, Cobalt manganese nickel sodium oxide  
( $\text{Co}_{0.5}\text{Mn}_{0.42}\text{Ni}_{0.08}\text{Na}_{0.67}\text{O}_2$ ) 476301-53-8, Cobalt manganese nickel sodium  
oxide ( $\text{Co}_{0.58}\text{Mn}_{0.38}\text{Ni}_{0.04}\text{Na}_{0.67}\text{O}_2$ ) 476301-54-9, Cobalt manganese sodium  
oxide ( $\text{Co}_{0.67}\text{Mn}_{0.33}\text{Na}_{0.67}\text{O}_2$ )  
RL: PRP (Properties)  
(structure and electrochem. properties of P2  $\text{Na}_{2/3}[\text{Co}_x\text{Ni}_{1/3-x}\text{Mn}_{2/3-x}\text{O}_2]$   
used as precursor for **electrode materials**)  
IT 259190-87-9, Lithium manganese nickel oxide ( $\text{Li}_{0.67}\text{Mn}_{0.67}\text{Ni}_{0.33}\text{O}_2$ )  
285979-02-4, Cobalt lithium manganese nickel oxide  
( $\text{Co}_{0.17}\text{Li}_{0.67}\text{Mn}_{0.58}\text{Ni}_{0.25}\text{O}_2$ ) 476301-55-0, Cobalt lithium  
manganese nickel oxide ( $\text{Co}_{0.08}\text{Li}_{0.67}\text{Mn}_{0.63}\text{Ni}_{0.29}\text{O}_2$ ) 476301-56-1,  
Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.12}\text{Li}_{0.67}\text{Mn}_{0.6}\text{Ni}_{0.27}\text{O}_2$ )  
476301-57-2, Cobalt lithium manganese nickel oxide  
( $\text{Co}_{0.25}\text{Li}_{0.67}\text{Mn}_{0.54}\text{Ni}_{0.21}\text{O}_2$ ) 476301-58-3, Cobalt lithium  
manganese nickel oxide ( $\text{Co}_{0.33}\text{Li}_{0.67}\text{Mn}_{0.5}\text{Ni}_{0.17}\text{O}_2$ ) 476301-59-4,  
Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.42}\text{Li}_{0.67}\text{Mn}_{0.46}\text{Ni}_{0.12}\text{O}_2$ )  
476301-60-7, Cobalt lithium manganese nickel oxide  
( $\text{Co}_{0.5}\text{Li}_{0.67}\text{Mn}_{0.42}\text{Ni}_{0.08}\text{O}_2$ ) 476301-61-8, Cobalt lithium  
manganese nickel oxide ( $\text{Co}_{0.58}\text{Li}_{0.67}\text{Mn}_{0.38}\text{Ni}_{0.04}\text{O}_2$ ) 476301-62-9, Cobalt  
lithium manganese oxide ( $\text{Co}_{0.67}\text{Li}_{0.67}\text{Mn}_{0.33}\text{O}_2$ )  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(structure and electrochem. properties of T2 and O2  
 $\text{Li}_{2/3}[\text{Co}_x\text{Ni}_{1/3-x}\text{Mn}_{2/3-x}\text{O}_2]$  **electrode materials**)

L9 ANSWER 4 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:470111 CAPLUS  
DOCUMENT NUMBER: 137:269599  
TITLE: The effects of Ni and Li doping on the performance of  
lithium manganese oxide material for lithium secondary  
batteries  
AUTHOR(S): Park, Ki Soo; Cho, Myung Hun; Park, Sang Ho; Nahm, Kee  
Suk; Sun, Yang Kook; Lee, Yun Sung; Yoshio, Masaki  
CORPORATE SOURCE: Chonbuk National University, College of Engineering,  
School of Chemical Engineering and Technology, Jeonju,  
561-756, S. Korea  
SOURCE: Electrochimica Acta (2002), 47(18), 2937-2942  
CODEN: ELCAAV; ISSN: 0013-4686  
PUBLISHER: Elsevier Science Ltd.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST nickel lithium doping lithium manganese oxide **electrode**  
secondary battery  
IT 12057-17-9, Lithium manganese oxide  $\text{LiMn}_2\text{O}_4$  462114-53-0, Lithium  
manganese oxide ( $\text{Li}_{0.87}\text{Mn}_{0.83}\text{O}_2$ ) 462114-56-3, Lithium manganese  
nickel oxide ( $\text{Li}_{0.7}\text{Mn}_{0.83}\text{Ni}_{0.17}\text{O}_2$ )  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(effects of Ni and Li doping on performance of lithium manganese oxide

material for lithium secondary batteries)

L9 ANSWER 5 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:272908 CAPLUS

DOCUMENT NUMBER: 136:297394

TITLE: Solid electrolyte cell

INVENTOR(S): Goto, Shuji; Hosoya, Mamoru; Endo, Takahiro

PATENT ASSIGNEE(S): Sony Corporation, Japan

SOURCE: Eur. Pat. Appl., 16 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| EP 1195826  | A2   | 20020410 | EP 2001-123774  | 20011004 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO |      |          |                 |          |
| JP 2002117844   | A2   | 20020419 | JP 2000-306876  | 20001005 |
| US 2002094481   | A1   | 20020718 | US 2001-966864  | 20010928 |
| CN 1349273  | A    | 20020515 | CN 2001-139323  | 20010930 |

PRIORITY APPLN. INFO.: JP 2000-306876 A 20001005

AB A solid electrolyte cell in which cell characteristics are not deteriorated even on overdischarge to the cell voltage of 0 V, such that the shape of the cell encapsulated in the laminate film is maintained. The cell includes a cathode contg. a compd. represented by the general formula  $\text{Li}x\text{Fe}1-y\text{MyPO}_4$  where  $0.05 \leq x \leq 1.2$ ,  $0 \leq y \leq 0.8$ , and M is at least one selected from the group consisting of Mn, Cr, Co, Cu, Ni, V, Mo, Ti, Zn, Al, Ga, Mg, B and Nb, an anode and a solid electrolyte. An electrode unit comprised of the cathode and the anode layered together with interposition of the solid electrolyte is encapsulated with a laminate film 2.

IT 7439-93-2D, Lithium, polyethylene oxide complex 7791-03-9, Lithium perchlorate 12031-65-1, Lithium nickel oxide  $\text{LiNiO}_2$  12057-17-9, Lithium manganese oxide  $\text{LiMn}_2\text{O}_4$  15365-14-7, Iron lithium phosphate  $\text{FeLiPO}_4$  25322-68-3D, Polyethylene oxide, lithium complex 116327-69-6, Cobalt lithium nickel oxide  $\text{Co}_0.1\text{LiNi}_0.9\text{O}_2$  147812-18-8, Iron lithium manganese oxide  $\text{Fe}_0.05\text{LiMn}_1.95\text{O}_4$  407606-22-8, Chromium iron lithium phosphate  $(\text{Cr}_0.0.8\text{Fe}_0.2-1\text{Li}_0.05-1.2(\text{PO}_4))$  407606-24-0, Cobalt iron lithium phosphate  $(\text{Co}_0.0.8\text{Fe}_0.2-1\text{Li}_0.05-1.2(\text{PO}_4))$  407606-26-2, Copper iron lithium phosphate  $(\text{Cu}_0.0.8\text{Fe}_0.2-1\text{Li}_0.05-1.2(\text{PO}_4))$  407606-28-4, Aluminum iron lithium phosphate  $(\text{Al}_0.0.8\text{Fe}_0.2-1\text{Li}_0.05-1.2(\text{PO}_4))$  407606-30-8, Gallium iron lithium phosphate  $(\text{Ga}_0.0.8\text{Fe}_0.2-1\text{Li}_0.05-1.2(\text{PO}_4))$  407606-32-0, Boron iron lithium phosphate  $(\text{B}_0.0.8\text{Fe}_0.2-1\text{Li}_0.05-1.2(\text{PO}_4))$  407606-34-2, Iron lithium manganese phosphate  $(\text{Fe}_0.2-1\text{Li}_0.05-1.2\text{Mn}_0.8(\text{PO}_4))$  407606-36-4, Iron lithium nickel phosphate  $(\text{Fe}_0.2-1\text{Li}_0.05-1.2\text{Ni}_0.8(\text{PO}_4))$  407606-39-7, Iron lithium vanadium phosphate  $(\text{Fe}_0.2-1\text{Li}_0.05-1.2\text{V}_0.8(\text{PO}_4))$  407606-42-2, Iron lithium molybdenum phosphate  $(\text{Fe}_0.2-1\text{Li}_0.05-1.2\text{Mo}_0.8(\text{PO}_4))$  407606-44-4, Iron lithium titanium phosphate  $(\text{Fe}_0.2-1\text{Li}_0.05-1.2\text{Ti}_0.8(\text{PO}_4))$  407606-47-7, Iron lithium zinc phosphate  $(\text{Fe}_0.2-1\text{Li}_0.05-1.2\text{Zn}_0.8(\text{PO}_4))$  407606-49-9, Iron lithium magnesium phosphate  $(\text{Fe}_0.2-1\text{Li}_0.05-1.2\text{Mg}_0.8(\text{PO}_4))$  407606-51-3, Iron lithium niobium phosphate  $(\text{Fe}_0.2-1\text{Li}_0.05-1.2\text{Nb}_0.8(\text{PO}_4))$  408331-94-2, Cobalt lithium nickel oxide  $((\text{Co},\text{Ni})\text{LiO}-2\text{O}_2)$  408331-95-3, Cobalt lithium manganese oxide  $((\text{Co},\text{Mn})\text{LiO}-2\text{O}_2)$  408331-96-4, Cobalt lithium zinc oxide  $((\text{Co},\text{Zn})\text{LiO}-2\text{O}_2)$  408331-97-5, Cobalt lithium tin oxide  $((\text{Co},\text{Sn})\text{LiO}-2\text{O}_2)$  408331-99-7, Cobalt lithium vanadium oxide  $((\text{Co},\text{V})\text{LiO}-2\text{O}_2)$  408332-00-3, Cobalt lithium titanium oxide  $((\text{Co},\text{Ti})\text{LiO}-2\text{O}_2)$  408332-01-4, Cobalt lithium molybdenum oxide  $((\text{Co},\text{Mo})\text{LiO}-2\text{O}_2)$  408332-02-5, Cobalt lithium tungsten oxide  $((\text{Co},\text{W})\text{LiO}-2\text{O}_2)$  408332-03-6, Cobalt lithium magnesium oxide  $((\text{Co},\text{Mg})\text{LiO}-2\text{O}_2)$  408332-04-7, Cobalt lithium strontium oxide

((Co,Sr)LiO-2O2) 408332-05-8, Cobalt lithium niobium oxide  
 ((Co,Nb)LiO-2O2) 408332-06-9, Cobalt iron lithium oxide ((Co,Fe)LiO-2O2)  
 408332-07-0, Cobalt copper lithium oxide ((Co,Cu)LiO-2O2) 408332-08-1,  
 Aluminum cobalt lithium oxide ((Al,Co)LiO-2O2) 408332-09-2, Cobalt  
 lithium borate oxide (CoO-1LiO-2(BO2)O-1O-2) 408332-10-5, Cobalt  
 gallium lithium oxide ((Co,Ga)LiO-2O2) 408332-11-6, Chromium cobalt  
 lithium oxide ((Cr,Co)LiO-2O2) 408332-12-7, Calcium cobalt lithium oxide  
 ((Ca,Co)LiO-2O2) 408332-13-8, Iron lithium nickel oxide ((Fe,Ni)LiO-2O2)  
 408332-14-9, Copper lithium nickel oxide ((Cu,Ni)LiO-2O2) 408332-15-0,  
 Aluminum lithium nickel oxide ((Al,Ni)LiO-2O2) 408332-16-1, Lithium  
 nickel borate oxide (LiO-2NiO-1(BO2)O-1O-2) 408332-17-2, Gallium  
 lithium nickel oxide ((Ga,Ni)LiO-2O2) 408332-18-3, Chromium lithium  
 nickel oxide ((Cr,Ni)LiO-2O2) 408332-19-4, Calcium lithium nickel oxide  
 ((Ca,Ni)LiO-2O2) 408332-20-7, Lithium manganese nickel oxide  
 (LiO-2(Mn,Ni)O2) 408332-21-8, Lithium nickel zinc oxide (LiO-2(Ni,Zn)O2)  
 408332-22-9, Lithium nickel tin oxide (LiO-2(Ni,Sn)O2) 408332-23-0,  
 Lithium nickel vanadium oxide (LiO-2(Ni,V)O2) 408332-24-1, Lithium  
 nickel titanium oxide (LiO-2(Ni,Ti)O2) 408332-25-2, Lithium nickel  
 tungsten oxide (LiO-2(Ni,W)O2) 408332-26-3, Lithium molybdenum nickel  
 oxide (LiO-2(Mo,Ni)O2) 408332-27-4, Lithium magnesium nickel oxide  
 (LiO-2(Mg,Ni)O2) 408332-28-5, Lithium nickel strontium oxide  
 (LiO-2(Ni,Sr)O2) 408332-29-6, Lithium nickel niobium oxide  
 (LiO-2(Ni,Nb)O2) 408332-30-9, Lithium manganese nickel oxide  
 (LiO-2(Mn,Ni)O2) 408332-31-0, Lithium manganese zinc oxide  
 (LiO-2(Mn,Zn)O2) 408332-32-1, Lithium manganese tin oxide  
 (LiO-2(Mn,Sn)O2) 408332-33-2, Lithium manganese vanadium oxide  
 (LiO-2(Mn,V)O2) 408332-34-3, Lithium manganese titanium oxide  
 (LiO-2(Mn,Ti)O2) 408332-35-4, Lithium manganese molybdenum oxide  
 (LiO-2(Mn,Mo)O2) 408332-36-5, Lithium manganese tungsten oxide  
 (LiO-2(Mn,W)O2) 408332-37-6, Lithium magnesium manganese oxide  
 (LiO-2(Mg,Mn)O2) 408332-38-7, Lithium manganese strontium oxide  
 (LiO-2(Mn,Sr)O2) 408332-39-8, Lithium manganese niobium oxide  
 (LiO-2(Mn,Nb)O2) 408332-40-1, Iron lithium manganese oxide  
 ((Fe,Mn)2LiO-2O2) 408332-42-3, Cobalt lithium manganese oxide  
 ((Co,Mn)2LiO-2O2) 408332-44-5, Aluminum lithium manganese oxide  
 ((Al,Mn)2LiO-2O2) 408332-45-6, Lithium manganese borate oxide  
 (LiO-2MnO-2(BO2)O-2O-4) 408332-46-7, Gallium lithium manganese oxide  
 ((Ga,Mn)2LiO-2O2) 408332-47-8, Chromium lithium manganese oxide  
 ((Cr,Mn)2LiO-2O2) 408332-48-9, Calcium lithium manganese oxide  
 ((Ca,Mn)2LiO-2O2) 408332-58-1, Aluminum cobalt lithium nickel oxide  
 (AlO.01Co0.98LiNiO.01O2) 412351-36-1, Iron lithium manganese phosphate  
 (Fe0.9LiMn0.1(PO4))  
 RL: DEV (Device component use); USES (Uses)  
 (solid electrolyte cell)

L9 ANSWER 6 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:138997 CAPLUS

DOCUMENT NUMBER: 136:186642

TITLE: Cathode active material for rechargeable lithium-ion battery

INVENTOR(S): Ogawa, Tomaru; Takahashi, Hidekazu; Katamura, Junji; Munakata, Fumio

PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan

SOURCE: Eur. Pat. Appl., 23 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.   | KIND | DATE     | APPLICATION NO. | DATE     |
|--|------|----------|-----------------|----------|
| EP 1180810   | A2   | 20020220 | EP 2001-119329  | 20010810 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, |      |          |                 |          |

IE, SI, LT, LV, FI, RO  
 JP 2002060223 A2 20020226 JP 2000-248962 20000818  
 JP 2002063903 A2 20020228 JP 2000-248961 20000818  
 US 2002022183 A1 20020221 US 2001-929359 20010815  
 PRIORITY APPLN. INFO.: JP 2000-248961 A 20000818  
 JP 2000-248962 A 20000818

AB A pos. **electrode** active material is a layered lithium manganese compd. represented by a general formula  $\text{Li}_{1-x}\text{MO}_2$ , where x is a lithium-deficient quantity and larger than 1/5, and M is manganese or metals of two or more kinds contg. manganese as a main component. The metals are preferably 3d-transition metals. The pos. **electrode** active material has a high capacity and is excellent in structure stability. A rechargeable lithium-ion battery uses a pos. **electrode** material contg. the pos. **electrode** active material and is excellent in cyclic stability.

IT 110665-91-3D, Lithium manganese oxide  $\text{Li}_{0.6}\text{MnO}_2$ , O-deficient  
 119000-28-1D, Lithium manganese oxide  $\text{Li}_{0.7}\text{MnO}_2$ , O-deficient  
 174221-18-2D, Lithium manganese oxide ( $\text{Li}_{1.5}\text{Mn}_2\text{O}_4$ ), O-deficient  
 202744-00-1D, Lithium manganese oxide  $\text{Li}_{0.67}\text{MnO}_2$ , O-deficient  
 259190-87-9D, Lithium manganese nickel oxide  $\text{Li}_{0.67}\text{Mn}_{0.67}\text{Ni}_{0.33}\text{O}_2$ , O-deficient  
 297173-44-5D, Iron lithium manganese oxide  $\text{Fe}_{0.33}\text{Li}_{0.67}\text{Mn}_{0.67}\text{O}_2$ , O-deficient  
 300543-79-7D, Lithium manganese nickel oxide ( $\text{Li}_{1.5}\text{Mn}_{1.5}\text{Ni}_{0.5}\text{O}_4$ ), O-deficient  
 398491-26-4D, Iron lithium manganese oxide ( $\text{Fe}_{0.33}\text{Li}_{0.75}\text{Mn}_{0.67}\text{O}_2$ ), O-deficient  
 398491-28-6D, Lithium manganese nickel oxide ( $\text{Li}_{0.75}\text{Mn}_{0.67}\text{Ni}_{0.33}\text{O}_2$ ), O-deficient  
 398491-29-7D, Iron lithium manganese oxide ( $\text{Fe}_{0.25}\text{Li}_{0.75}\text{Mn}_{0.75}\text{O}_2$ ), O-deficient  
 398491-30-0D, Chromium lithium manganese oxide ( $\text{Cr}_{0.33}\text{Li}_{0.75}\text{Mn}_{0.67}\text{O}_2$ ), O-deficient  
 398491-31-1D, Cobalt lithium manganese oxide ( $\text{Co}_{0.33}\text{Li}_{0.75}\text{Mn}_{0.67}\text{O}_2$ ), O-deficient  
 398491-32-2D, Chromium cobalt lithium manganese oxide ( $\text{Cr}_{0.34}\text{Co}_{0.34}\text{Li}_{0.75}\text{Mn}_{0.33}\text{O}_2$ ), O-deficient  
 398491-33-3D, O-deficient  
 398491-34-4D, O-deficient  
 RL: DEV (Device component use); USES (Uses)  
 (cathode active material for rechargeable lithium-ion battery)

L9 ANSWER 7 OF 18 CAPLUS COPYRIGHT 2003 ACS  
 ACCESSION NUMBER: 2002:90542 CAPLUS  
 DOCUMENT NUMBER: 136:137422  
 TITLE: Rechargeable lithium battery  
 INVENTOR(S): Uemura, Ryuzo; Takekawa, Toshihiro; Munakata, Fumio  
 PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan  
 SOURCE: U.S. Pat. Appl. Publ., 14 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

| PATENT NO.             | KIND | DATE     | APPLICATION NO. | DATE       |
|------------------------|------|----------|-----------------|------------|
| US 2002012830          | A1   | 20020131 | US 2001-917745  | 20010731   |
| JP 2002042893          | A2   | 20020208 | JP 2000-230492  | 20000731   |
| PRIORITY APPLN. INFO.: |      |          | JP 2000-230492  | A 20000731 |

AB A rechargeable lithium battery includes a neg. **electrode** material having a total irreversible capacity of 45% or less of a total capacity of a pos. **electrode** material. By adjusting the irreversible capacity of the neg. **electrode** material in a wide range, a cryst. structure of the pos. **electrode** material during charge-discharge is stably maintained, and cyclic resistance of the rechargeable lithium battery is improved. Moreover, the rechargeable lithium battery having a large capacity and high cyclic resistance at high temp. can be provided by the use of Li deficient type lithium manganese oxide of a layer structure as a pos. **electrode** material.

IT 7440-44-0, Carbon, uses 356786-63-5D, Cobalt lithium manganese oxide

Co<sub>0.5</sub>Li<sub>0.67</sub>Mn<sub>0.5</sub>O<sub>2</sub>, O-deficient 356786-64-6D, Cobalt lithium manganese oxide Co<sub>0.5</sub>Li<sub>0.83</sub>Mn<sub>0.05</sub>O<sub>2</sub>, O-deficient 356786-65-7D, Cobalt lithium manganese oxide Co<sub>0.5</sub>Li<sub>0.97</sub>Mn<sub>0.5</sub>O<sub>2</sub>, O-deficient 356786-66-8D, Cobalt lithium manganese oxide Co<sub>0.25</sub>Li<sub>0.75</sub>Mn<sub>0.75</sub>O<sub>2</sub>, O-deficient 356786-67-9D, Lithium manganese nickel oxide Li<sub>0.83</sub>Mn<sub>0.75</sub>Ni<sub>0.25</sub>O<sub>2</sub>, O-deficient 356786-68-0D, Iron lithium manganese oxide Fe<sub>0.33</sub>Li<sub>0.83</sub>Mn<sub>0.67</sub>O<sub>2</sub>, O-deficient 356786-69-1D, Aluminum lithium manganese oxide Al<sub>0.25</sub>Li<sub>0.83</sub>Mn<sub>0.75</sub>O<sub>2</sub>, O-deficient 356786-70-4D, Chromium lithium manganese oxide Cr<sub>0.25</sub>Li<sub>0.83</sub>Mn<sub>0.75</sub>O<sub>2</sub>, O-deficient 356786-71-5D, Gallium lithium manganese oxide Ga<sub>0.25</sub>Li<sub>0.83</sub>Mn<sub>0.75</sub>O<sub>2</sub>, O-deficient 356786-72-6D, Indium lithium manganese oxide In<sub>0.25</sub>Li<sub>0.83</sub>Mn<sub>0.75</sub>O<sub>2</sub>, O-deficient 356786-74-8D, Lithium manganese vanadium oxide Li<sub>0.83</sub>Mn<sub>0.75</sub>V<sub>0.25</sub>O<sub>2</sub>, O-deficient 356786-75-9D, Iron lithium manganese oxide (Fe<sub>0.12</sub>Li<sub>0.75</sub>Mn<sub>0.88</sub>O<sub>2</sub>), O-deficient 356786-76-0D, Lithium manganese niobium oxide Li<sub>0.83</sub>Mn<sub>0.75</sub>Nb<sub>0.25</sub>O<sub>2</sub>, O-deficient 356786-77-1D, Lithium manganese tantalum oxide Li<sub>0.83</sub>Mn<sub>0.75</sub>Ta<sub>0.25</sub>O<sub>2</sub>, O-deficient 356786-78-2D, Lithium manganese titanium oxide Li<sub>0.83</sub>Mn<sub>0.75</sub>Ti<sub>0.25</sub>O<sub>2</sub>, O-deficient 393583-27-2D, Lithium manganese zinc oxide (Li<sub>0.83</sub>Mn<sub>0.75</sub>Zn<sub>0.25</sub>O<sub>2</sub>), O-deficient

RL: DEV (Device component use); USES (Uses)

(rechargeable lithium battery with improved cyclic resistance)

L9 ANSWER 8 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:10180 CAPLUS

DOCUMENT NUMBER: 136:72288

TITLE: Lithium secondary battery

INVENTOR(S): Nakura, Kensuke

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: Eur. Pat. Appl., 11 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| EP 1168472  | A1   | 20020102 | EP 2001-305602  | 20010627 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO |      |          |                 |          |
| JP 2002083597   | A2   | 20020322 | JP 2001-146741  | 20010516 |
| CN 1331498  | A    | 20020116 | CN 2001-122669  | 20010628 |
| US 2002015890   | A1   | 20020207 | US 2001-893895  | 20010629 |
| US 6537702  | B2   | 20030325 |                 |          |

PRIORITY APPLN. INFO.:

JP 2000-198299 A 20000630

JP 2001-146741 A 20010516

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AB A lithium secondary battery having a higher energy d. and a longer cycle life than conventional batteries is disclosed, which comprises a pos. **electrode** capable of absorbing and desorbing lithium, a nonaq. electrolyte and a neg. **electrode** capable of absorbing and desorbing lithium, wherein the neg. **electrode** comprises a nitride represented by the general formula:  $\text{Li}_x\text{A}_y\text{Me}_z\text{N}$ , where A is boron, silicon or aluminum, Me is at least one element selected from the group consisting of transition metal elements and metal elements of Group IIIB, IVB and VB, and x, y and z satisfy  $0 < x < 3$ ,  $0 < y \leq 1$ ,  $0 < z \leq 1$  and  $0 < x + y + z \leq 3$ .

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 12408-97-8, Boron lithium nitride BLi<sub>3</sub>N<sub>2</sub> 12597-68-1, Stainless steel, uses 21324-40-3, Lithium hexafluorophosphate 174180-05-3, Cobalt lithium oxide CoLi<sub>0.1</sub>-1.2O<sub>2</sub> 174180-06-4, Lithium nickel oxide Li<sub>0.1</sub>-1.2NiO<sub>2</sub> 188405-67-6, Lithium manganese oxide Li<sub>0.1</sub>-1.2Mn<sub>2</sub>O<sub>4</sub> 296800-04-9, Lithium manganese oxide Li<sub>0.1</sub>-1.2MnO<sub>2</sub> 296800-06-1, Cobalt lithium nickel oxide

Co0-0.9Li0-1.2Ni0.1-102 296800-28-7, Lithium manganese sodium oxide  
 Li0-1.2Mn1.1-2Na0-0.904 296800-30-1, Lithium magnesium manganese oxide  
 Li0-1.2Mg0-0.9Mn1.1-204 296800-32-3, Lithium manganese scandium oxide  
 Li0-1.2Mn1.1-2Sc0-0.904 296800-35-6, Lithium manganese yttrium oxide  
 Li0-1.2Mn1.1-2Y0-0.904 296800-38-9, Iron Lithium manganese oxide  
 Fe0-0.9Li0-1.2Mn1.1-204 296800-40-3, Cobalt Lithium manganese oxide  
 Co0-0.9Li0-1.2Mn1.1-204 296800-43-6, Lithium manganese nickel oxide  
 Li0-1.2Mn1.1-2Ni0-0.904 296800-49-2, Copper Lithium manganese oxide  
 Cu0-0.9Li0-1.2Mn1.1-204 296800-51-6, Lithium manganese zinc oxide  
 (Li0-1.2Mn1.1-2Zn0-0.904) 296800-52-7, Aluminum lithium manganese oxide  
 (Al0-0.9Li0-1.2Mn1.1-204) 296800-54-9, Lead lithium manganese oxide  
 (Pb0-0.9Li0-1.2Mn1.1-204) 296800-56-1, Antimony lithium manganese oxide  
 (Sb0-0.9Li0-1.2Mn1.1-204) 383415-14-3, Lithium nitride silicide  
 (Li8N7Si) 383415-15-4, Aluminum lithium nitride (AlLiN2) 383415-16-5,  
 Cobalt lithium sodium oxide (Co0-0.9Li0-1.2Na0.1-102-2.3) 383415-17-6,  
 Cobalt lithium magnesium oxide (Co0-0.9Li0-1.2Mg0.1-102-2.3)  
 383415-18-7, Cobalt lithium scandium oxide (Co0-0.9Li0-1.2Sc0.1-102-2.3)  
 383415-19-8, Cobalt lithium yttrium oxide (Co0-0.9Li0-1.2Y0.1-102-2.3)  
 383415-20-1, Cobalt lithium manganese oxide (Co0-0.9Li0-1.2Mn0.1-102-2.3)  
 383415-21-2, Cobalt iron lithium oxide (Co0-0.9Fe0.1-1Li0-1.202-2.3)  
 383415-22-3, Cobalt lithium nickel oxide (Co0-0.9Li0-1.2Ni0.1-102-2.3)  
 383415-23-4, Cobalt copper lithium oxide (Co0-0.9Cu0.1-1Li0-1.202-2.3)  
 383415-24-5, Cobalt lithium zinc oxide (Co0-0.9Li0-1.2Zn0.1-102-2.3)  
 383415-25-6, Aluminum cobalt lithium oxide (Al0.1-1Co0-0.9Li0-1.202-2.3)  
 383415-26-7, Chromium cobalt lithium oxide (Cr0.1-1Co0-0.9Li0-1.202-2.3)  
 383415-27-8, Cobalt lead lithium oxide (Co0-0.9Pb0.1-1Li0-1.202-2.3)  
 383415-28-9, Antimony cobalt lithium oxide (Sb0.1-1Co0-0.9Li0-1.202-2.3)  
 383415-29-0, Cobalt lithium borate oxide (Co0-0.9Li0-1.2(BO2)0.1-100-2.1)  
 383415-30-3, Lithium nickel sodium oxide (Li0-1.2Ni0.1-1Na0-0.902-2.3)  
 383415-31-4, Lithium magnesium nickel oxide (Li0-1.2Mg0-0.9Ni0.1-102-2.3)  
 383415-32-5, Lithium nickel scandium oxide (Li0-1.2Ni0.1-1Sc0-0.902-2.3)  
 383415-33-6, Lithium nickel yttrium oxide (Li0-1.2Ni0.1-1Y0-0.902-2.3)  
 383415-35-8, Lithium manganese nickel oxide (Li0-1.2Mn0-0.9Ni0.1-102-2.3)  
 383415-37-0, Iron lithium nickel oxide (Fe0-0.9Li0-1.2Ni0.1-102-2.3)  
 383415-40-5, Copper lithium nickel oxide (Cu0-0.9Li0-1.2Ni0.1-102-2.3)  
 383415-42-7, Lithium nickel zinc oxide (Li0-1.2Ni0.1-1Zn0-0.902-2.3)  
 383415-44-9, Aluminum lithium nickel oxide (Al0-0.9Li0-1.2Ni0.1-102-2.3)  
 383415-46-1, Chromium lithium nickel oxide (Cr0-0.9Li0-1.2Ni0.1-102-2.3)  
 383415-48-3, Lead lithium nickel oxide (Pb0-0.9Li0-1.2Ni0.1-102-2.3)  
 383415-50-7, Antimony lithium nickel oxide (Sb0-0.9Li0-1.2Ni0.1-102-2.3)  
 383415-51-8, Lithium nickel borate oxide (Li0-1.2Ni0.1-1(BO2)0-0.900.2-2.3)  
 383415-52-9, Chromium lithium manganese oxide (Cr0-0.9Li0-1.2Mn1.1-204)  
 383415-53-0, Lithium manganese borate oxide (Li0-1.2Mn1.1-2(BO3)0-0.901.3-4)

RL: DEV (Device component use); USES (Uses)  
 (lithium secondary battery)

L9 ANSWER 9 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2001:654809 CAPLUS  
 DOCUMENT NUMBER: 135:198007  
 TITLE: Cathode material for nonaqueous electrolyte lithium secondary battery  
 INVENTOR(S): Munakata, Fumio; Fukuzawa, Tatsuhiko; Ohsawa, Yasuhiko; Tanjo, Yuuji; Mihara, Takuya; Kimura, Takashi; Sunahara, Kazuo; Suhara, Manabu  
 PATENT ASSIGNEE(S): Nissan Motor Company, Limited, Japan  
 SOURCE: Eur. Pat. Appl., 15 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------|------|------|-----------------|------|
|------------|------|------|-----------------|------|

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EP 1130665            A1    20010905            EP 2001-104744    20010226  
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
IE, SI, LT, LV, FI, RO  
JP 2001250551        A2    20010914            JP 2000-58097       20000303  
US 2001024753        A1    20010927            US 2001-791877     20010226

PRIORITY APPLN. INFO.:

JP 2000-58097        A    20000303

REFERENCE COUNT:            11        THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AB    A pos. **electrode** active material for a nonaq. electrolyte  
secondary battery includes at least a lithium-contg. manganese layered  
composite oxide represented by the general formula  $\text{Li}_{1-x}\text{Mn}_1-y\text{MyO}_2$ . .psi..  
The lithium-contg. manganese composite oxide is deficient in lithium with  
respect to the stoichiometric compn. of a layered crystal structure  
represented by the general formula  $\text{LiMeO}_2$ . Part of Mn is replaced by a  
substitute metal such as Co, Ni, Fe, Al, Ga, In, V, Nb, Ta, Ti, Zr, Ce or  
Cr.

IT    7439-93-2, Lithium, uses    7440-44-0, Carbon, uses    356786-63-5D, Cobalt  
lithium manganese oxide ( $\text{Co}_{0.5}\text{Li}_{0.67}\text{Mn}_{0.5}\text{O}_2$ ), O-deficient    356786-64-6D,  
Cobalt lithium manganese oxide ( $\text{Co}_{0.5}\text{Li}_{0.83}\text{Mn}_{0.5}\text{O}_2$ ), O-deficient  
356786-65-7D, Cobalt lithium manganese oxide ( $\text{Co}_{0.5}\text{Li}_{0.97}\text{Mn}_{0.5}\text{O}_2$ ),  
O-deficient    356786-66-8D, Cobalt lithium manganese oxide  
( $\text{Co}_{0.25}\text{Li}_{0.75}\text{Mn}_{0.75}\text{O}_2$ ), O-deficient    356786-67-9D, Lithium manganese  
nickel oxide ( $\text{Li}_{0.83}\text{Mn}_{0.75}\text{Ni}_{0.25}\text{O}_2$ ), O-deficient    356786-68-0D, Iron  
lithium manganese oxide ( $\text{Fe}_{0.33}\text{Li}_{0.83}\text{Mn}_{0.67}\text{O}_2$ ), O-deficient  
356786-69-1D, Aluminum lithium manganese oxide ( $\text{Al}_{0.25}\text{Li}_{0.83}\text{Mn}_{0.75}\text{O}_2$ ),  
O-deficient    356786-70-4D, Chromium lithium manganese oxide  
( $\text{Cr}_{0.25}\text{Li}_{0.83}\text{Mn}_{0.75}\text{O}_2$ ), O-deficient    356786-71-5D, Gallium lithium  
manganese oxide ( $\text{Ga}_{0.25}\text{Li}_{0.83}\text{Mn}_{0.75}\text{O}_2$ ), O-deficient    356786-72-6D, Indium  
lithium manganese oxide ( $\text{In}_{0.25}\text{Li}_{0.83}\text{Mn}_{0.75}\text{O}_2$ ), O-deficient  
356786-73-7D, Lithium manganese zirconium oxide ( $\text{Li}_{0.83}\text{Mn}_{0.75}\text{Zr}_{0.25}\text{O}_2$ ),  
O-deficient    356786-74-8D, Lithium manganese vanadium oxide  
( $\text{Li}_{0.83}\text{Mn}_{0.75}\text{V}_{0.25}\text{O}_2$ ), O-deficient    **356786-75-9D**, Iron lithium  
manganese oxide ( $\text{Fe}_{0.12}\text{Li}_{0.75}\text{Mn}_{0.88}\text{O}_2$ ), O-deficient    356786-76-0D,  
Lithium manganese niobium oxide ( $\text{Li}_{0.83}\text{Mn}_{0.75}\text{Nb}_{0.25}\text{O}_2$ ), O-deficient  
356786-77-1D, Lithium manganese tantalum oxide ( $\text{Li}_{0.83}\text{Mn}_{0.75}\text{Ta}_{0.25}\text{O}_2$ ),  
O-deficient    356786-78-2D, Lithium manganese titanium oxide  
( $\text{Li}_{0.83}\text{Mn}_{0.75}\text{Ti}_{0.25}\text{O}_2$ ), O-deficient

RL: DEV (Device component use); USES (Uses)

(cathode material for nonaq. electrolyte lithium secondary battery)

L9    ANSWER 10 OF 18    CAPLUS    COPYRIGHT 2003 ACS

ACCESSION NUMBER:            2001:7553    CAPLUS

DOCUMENT NUMBER:            134:74026

TITLE:                        Layered lithium manganese oxide bronze and electrodes  
thereof

INVENTOR(S):                 Dahn, Jeffrey R.; Paulsen, Jens M.

PATENT ASSIGNEE(S):         Chemetals Technology Corporation, USA

SOURCE:                      U.S., 16 pp.  
CODEN: USXXAM

DOCUMENT TYPE:                Patent

LANGUAGE:                     English

FAMILY ACC. NUM. COUNT:      1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE     | APPLICATION NO. | DATE     |
|------------|------|----------|-----------------|----------|
| US 6168887 | B1   | 20010102 | US 1999-231636  | 19990115 |

PRIORITY APPLN. INFO.:

US 1999-231636        19990115

REFERENCE COUNT:            20        THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST    battery **electrode** lithium manganese oxide bronze

IT    249915-44-4, Lithium manganese oxide  $\text{Li}_{0.83}\text{Mn}_{0.83}\text{O}_2$     249915-53-5, Lithium  
manganese oxide  $\text{Li}_{0.72}\text{Mn}_{0.94}\text{O}_2$     249915-56-8, Cobalt Lithium manganese

oxide  $\text{Co}_{0.15}\text{Li}_{0.67}\text{Mn}_{0.85}\text{O}_2$  249915-58-0, Cobalt Lithium manganese oxide  
 $\text{Co}_{0.15}\text{Li}_{0.83}\text{Mn}_{0.68}\text{O}_2$  314263-06-4, Lithium manganese oxide  
( $\text{Li}_{0.5-1.7}\text{Mn}_{0.6-101.5-2.5}$ ) 314263-08-6, Cobalt lithium manganese oxide  
( $\text{Co}_{0-0.4}\text{Li}_{0.5-1.3}\text{Mn}_{0.6-101.5-2.5}$ ) 314263-09-7, Chromium lithium  
manganese oxide ( $\text{Cr}_{0-0.4}\text{Li}_{0.5-1.3}\text{Mn}_{0.6-101.5-2.5}$ ) 314263-10-0, Copper  
lithium manganese oxide ( $\text{Cu}_{0-0.4}\text{Li}_{0.5-1.3}\text{Mn}_{0.6-101.5-2.5}$ ) 314263-11-1,  
Aluminum lithium manganese oxide ( $\text{Al}_{0-0.4}\text{Li}_{0.5-1.3}\text{Mn}_{0.6-101.5-2.5}$ )  
**314263-13-3**, Iron lithium manganese oxide ( $\text{Fe}_{0-0.4}\text{Li}_{0.5-1.3}\text{Mn}_{0.6-101.5-2.5}$ )  
**314263-15-5**, Lithium manganese nickel oxide  
( $\text{Li}_{0.5-1.3}\text{Mn}_{0.6-1}\text{Ni}_{0-0.4}\text{O}_{1.5-2.5}$ ) 314263-17-7, Lithium manganese  
titanium oxide ( $\text{Li}_{0.5-1.3}\text{Mn}_{0.6-1}\text{Ti}_{0-0.4}\text{O}_{1.5-2.5}$ ) 314263-18-8, Lithium  
manganese vanadium oxide ( $\text{Li}_{0.5-1.3}\text{Mn}_{0.6-1}\text{V}_{0-0.4}\text{O}_{1.5-2.5}$ )  
RL: DEV (Device component use); USES (Uses)  
(layered lithium manganese oxide bronze and electrodes thereof)

L9 ANSWER 11 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2000:826785 CAPLUS  
DOCUMENT NUMBER: 134:134019  
TITLE: Layered  $\text{Li}_x\text{Mn}_1\text{-yNi}_y\text{O}_2$  intercalation electrodes  
AUTHOR(S): Quine, Tracey E.; Duncan, Morven J.; Armstrong, A.  
Robert; Robertson, Alastair D.; Bruce, Peter G.  
CORPORATE SOURCE: School of Chemistry, University of St. Andrews, St.  
Andrews, Fife, KY16 9ST, UK  
SOURCE: Journal of Materials Chemistry (2000), 10(12),  
2838-2841  
CODEN: JMACEP; ISSN: 0959-9428  
PUBLISHER: Royal Society of Chemistry  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AB Synthesis of the layered lithium intercalation compd.  $\text{Li}_x\text{Mn}_1\text{-yNi}_y\text{O}_2$ ,  
with the O3 (.alpha.- $\text{NaFeO}_2$ ) structure is reported and it is shown to  
exhibit amongst the highest capacity to cycle lithium (charge) on  
intercalation/deintercalation (220 mA h g<sup>-1</sup> between potential limits of  
2.4 to 4.8 V) of any such material and at a relatively high  
charge/discharge rate; the ion exchange conditions used in the synthesis  
have an important influence on the defect chem. of the host structure and  
this in turn influences the performance of the compd. as an  
**electrode** in rechargeable lithium batteries.

IT **321923-70-0P**, Lithium manganese nickel sodium oxide  
( $\text{Li}_{0.68}\text{Mn}_{0.88}\text{Ni}_{0.04}\text{Na}_{0.03}\text{O}_2$ ) **321923-71-1P**, Lithium manganese  
nickel sodium oxide ( $\text{Li}_{0.75}\text{Mn}_{0.93}\text{Ni}_{0.05}\text{Na}_{0.01}\text{O}_2$ ) **321923-72-2P**,  
Lithium manganese nickel sodium oxide ( $\text{Li}_{0.6}\text{Mn}_{0.87}\text{Ni}_{0.07}\text{Na}_{0.02}\text{O}_2$ )  
**321923-73-3P**, Lithium manganese nickel sodium oxide  
( $\text{Li}_{0.65}\text{Mn}_{0.92}\text{Ni}_{0.07}\text{Na}_{0.01}\text{O}_2$ ) **321923-74-4P**, Lithium manganese  
nickel sodium oxide ( $\text{Li}_{0.55}\text{Mn}_{0.87}\text{Ni}_{0.09}\text{Na}_{0.03}\text{O}_2$ ) **321923-75-5P**,  
Lithium manganese nickel sodium oxide ( $\text{Li}_{0.68}\text{Mn}_{0.92}\text{Ni}_{0.1}\text{Na}_{0.01}\text{O}_2$ )  
RL: DEV (Device component use); SPN (Synthetic preparation); TEM  
(Technical or engineered material use); PREP (Preparation); USES (Uses)  
(layered  $\text{Li}_x\text{Mn}_1\text{-yNi}_y\text{O}_2$  intercalation electrodes)

L9 ANSWER 12 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2000:723269 CAPLUS  
DOCUMENT NUMBER: 133:269461  
TITLE: Nonaqueous lithium electrolyte secondary battery  
INVENTOR(S): Watanabe, Shoichiro; Iwamoto, Kazuya; Ueda, Atsushi;  
Nunome, Jun; Koshina, Hizuru  
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan  
SOURCE: Eur. Pat. Appl., 9 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1



## PATENT INFORMATION:

| PATENT NO. | KIND | DATE     | APPLICATION NO. | DATE     |
|------------|------|----------|-----------------|----------|
| EP 1043794 | A2   | 20001011 | EP 2000-102959  | 20000214 |
| EP 1043794 | A3   | 20021218 |                 |          |

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO

|            |   |          |                |          |
|------------|---|----------|----------------|----------|
| US 6165647 | A | 20001226 | US 1999-289589 | 19990409 |
| CN 1270424 | A | 20001018 | CN 2000-103653 | 20000229 |

PRIORITY APPLN. INFO.: US 1999-289589 A 19990409

OTHER SOURCE(S): MARPAT 133:269461

AB A battery (excellent in high temp. storage characteristics) comprises a pos. **electrode** having a pos. **electrode** active material contg. an transition metal complex oxide contg. lithium, a neg. **electrode** contg. a neg. **electrode** material capable of storing and releasing a lithium ion, and an electrolytic soln. contg. a nonaq. solvent, an electrolyte, and an org. compd. expressed in formula I, where R1, R2, R3, R4, R5, and R6 have individually at least one of H and a group contg. a vinyl group, and the no. of H substituent is four or less.

IT 79-20-9, Methyl acetate 96-49-1, Ethylene carbonate 105-37-3, Ethyl propionate 105-58-8, Diethyl carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 554-12-1, Methyl propionate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl carbonate 872-36-6, 1,3-Dioxol-2-one 4437-85-8, Butylene carbonate 7439-93-2, Lithium, uses 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 21324-40-3, Lithium hexafluorophosphate 174180-05-3, Cobalt lithium oxide  $\text{CoLiO-1.2O}_2$  174180-06-4, Lithium nickel oxide  $\text{LiO-1.2NiO}_2$  188405-67-6, Lithium manganese oxide  $\text{LiO-1.2Mn}_2\text{O}_4$  296800-04-9, Lithium manganese oxide ( $\text{LiO-1.2MnO}_2$ ) 296800-06-1, Cobalt lithium nickel oxide ( $\text{CoO-0.9LiO-1.2NiO-1.1O}_2$ ) 296800-08-3, Cobalt lithium vanadium oxide ( $\text{CoO-0.9-0.98LiO-1.2V}_2\text{O}_7\text{-0.1O}_2$ ) 296800-10-7, Lithium nickel titanium oxide ( $\text{LiO-1.2NiO-1.1TiO-0.9O}_2$ ) 296800-12-9, Lithium nickel vanadium oxide ( $\text{LiO-1.2NiO-1.1V}_2\text{O}_7\text{-0.9O}_2$ ) 296800-15-2, Lithium manganese nickel oxide ( $\text{LiO-1.2MnO-0.9NiO-1.1O}_2$ ) 296800-18-5, Iron lithium nickel oxide ( $\text{FeO-0.9LiO-1.2NiO-1.1O}_2$ ) 296800-20-9, Cobalt lithium nickel titanium oxide ( $\text{(Co,Ni,Ti)LiO-1.2O}_2$ ) 296800-21-0, Cobalt lithium manganese nickel oxide ( $\text{(Co,Mn,Ni)LiO-1.2O}_2$ ) 296800-22-1, Aluminum cobalt lithium nickel oxide ( $\text{(Al,Co,Ni)LiO-1.2O}_2$ ) 296800-23-2, Cobalt lithium magnesium nickel oxide ( $\text{(Co,Mg,Ni)LiO-1.2O}_2$ ) 296800-25-4, Cobalt iron lithium nickel oxide ( $\text{(Co,Fe,Ni)LiO-1.2O}_2$ ) 296800-27-6, Cobalt lithium nickel zirconium oxide ( $\text{(Co,Ni,Zr)LiO-1.2O}_2$ ) 296800-28-7, Lithium manganese sodium oxide ( $\text{LiO-1.2Mn}_2\text{O}_4\text{-0.9Na}_2\text{O}$ ) 296800-30-1, Lithium magnesium manganese oxide ( $\text{LiO-1.2MgO-0.9Mn}_2\text{O}_3$ ) 296800-32-3, Lithium manganese scandium oxide ( $\text{LiO-1.2Mn}_2\text{O}_4\text{-0.9Sc}_2\text{O}_3$ ) 296800-35-6, Lithium manganese yttrium oxide ( $\text{LiO-1.2Mn}_2\text{O}_4\text{-0.9Y}_2\text{O}_3$ ) 296800-38-9, Iron lithium manganese oxide ( $\text{FeO-0.9LiO-1.2Mn}_2\text{O}_4$ ) 296800-40-3, Cobalt lithium manganese oxide ( $\text{CoO-0.9LiO-1.2Mn}_2\text{O}_4$ ) 296800-43-6, Lithium manganese nickel oxide ( $\text{LiO-1.2Mn}_2\text{O}_4\text{-0.9NiO}$ ) 296800-45-8, Lithium manganese titanium oxide ( $\text{LiO-1.2Mn}_2\text{O}_4\text{-0.9TiO}_2$ ) 296800-47-0, Lithium manganese zirconium oxide ( $\text{LiO-1.2Mn}_2\text{O}_4\text{-0.9ZrO}_2$ ) 296800-49-2, Copper lithium manganese oxide ( $\text{CuO-0.9LiO-1.2Mn}_2\text{O}_4$ ) 296800-51-6, Lithium manganese zinc oxide ( $\text{LiO-1.2Mn}_2\text{O}_4\text{-0.9ZnO}$ ) 296800-52-7, Aluminum lithium manganese oxide ( $\text{AlO-0.9LiO-1.2Mn}_2\text{O}_4$ ) 296800-54-9, Lead lithium manganese oxide ( $\text{PbO-0.9LiO-1.2Mn}_2\text{O}_4$ ) 296800-56-1, Antimony lithium manganese oxide ( $\text{SbO-0.9LiO-1.2Mn}_2\text{O}_4$ )  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte lithium secondary battery)

L9 ANSWER 13 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2000:723268 CAPLUS

DOCUMENT NUMBER: 133:284159

TITLE: Nonaqueous electrolyte secondary battery

INVENTOR(S): Watanabe, Shoichiro; Iwamoto, Kazuya; Ueda, Astushi;

PATENT ASSIGNEE(S): Nunome, Jun; Koshina, Hizuru  
 SOURCE: Matsushita Electric Industrial Co., Ltd., Japan  
 Eur. Pat. Appl., 10 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE     | APPLICATION NO. | DATE     |
|------------|------|----------|-----------------|----------|
| EP 1043793 | A2   | 20001011 | EP 2000-102958  | 20000214 |
| EP 1043793 | A3   | 20021016 |                 |          |

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
 IE, SI, LT, LV, FI, RO

|            |    |          |                |          |
|------------|----|----------|----------------|----------|
| US 6303250 | B1 | 20011016 | US 1999-289468 | 19990409 |
| CN 1270425 | A  | 20001018 | CN 2000-103654 | 20000229 |

PRIORITY APPLN. INFO.: US 1999-289468 A 19990409

OTHER SOURCE(S): MARPAT 133:284159

AB A battery (excellent in high temp. storage characteristics) comprises a pos. **electrode** contg. a pos. **electrode** active material, a neg. **electrode** contg. a neg. **electrode** material, a nonaq. solvent, and an electrolytic soln. contg. at least one of org. compds. expressed in formula  $R_1R_2C:CR_3R_4$  (where  $R_1, R_2, R_3, R_4$  are individually at least one selected from the group consisting of H, aryl group, and aryl group having a functional group contg. a substituent having an electron attracting property, and the no. of H is three or less) and formula (I) ( $n = 0-2$ ). The pos. **electrode** active material has an oxide compd. contg. a lithium atom, and the neg. **electrode** material has a material capable of storing and releasing a lithium ion.

IT 79-20-9, Methyl acetate 96-49-1, Ethylene carbonate 105-37-3, Ethyl propionate 105-58-8, Diethyl carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 554-12-1, Methyl propionate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl carbonate 872-36-6, 1,3-Dioxol-2-one 4437-85-8, Butylene carbonate 7439-93-2, Lithium, uses 7440-44-0, Carbon, uses 21324-40-3, Lithium hexafluorophosphate 174180-05-3, Cobalt lithium oxide  $CoLiO-1.2O_2$  174180-06-4, Lithium nickel oxide  $LiO-1.2NiO_2$  177997-13-6, Aluminum Cobalt lithium nickel oxide 180997-14-2, Cobalt lithium magnesium nickel oxide 182442-95-1, Cobalt lithium manganese nickel oxide 182442-96-2, Cobalt iron lithium nickel oxide 188405-67-6, Lithium manganese oxide  $LiO-1.2Mn_2O_4$  191025-46-4, Cobalt lithium nickel zirconium oxide 244304-20-9, Cobalt lithium nickel titanium oxide 296800-04-9, Lithium manganese oxide  $LiO-1.2MnO_2$  296800-06-1, Cobalt Lithium nickel oxide  $CoO-0.9LiO-1.2NiO-1.1O_2$  296800-08-3, Cobalt Lithium vanadium oxide  $CoO-0.9-0.98LiO-1.2V_2O_7-0.1O_2$  296800-10-7, Lithium nickel titanium oxide  $LiO-1.2NiO-1.1TiO-0.9O_2$  296800-12-9, Lithium nickel vanadium oxide  $LiO-1.2NiO-1.1V_2O_7-0.9O_2$  **296800-15-2**, Lithium manganese nickel oxide  $LiO-1.2MnO-0.9NiO-1.1O_2$  296800-18-5, Iron Lithium nickel oxide  $FeO-0.9LiO-1.2NiO-1.1O_2$  296800-28-7, Lithium manganese sodium oxide  $LiO-1.2Mn_2O_4-1.2Na_2O-0.9O_4$  296800-30-1, Lithium magnesium manganese oxide  $LiO-1.2MgO-0.9Mn_2O_4$  296800-32-3, Lithium manganese scandium oxide  $LiO-1.2Mn_2O_4-1.2Sc_2O_3-0.9O_4$  296800-35-6, Lithium manganese yttrium oxide  $LiO-1.2Mn_2O_4-1.2Y_2O_3-0.9O_4$  296800-38-9, Iron Lithium manganese oxide  $FeO-0.9LiO-1.2Mn_2O_4$  296800-40-3, Cobalt Lithium manganese oxide  $CoO-0.9LiO-1.2Mn_2O_4$  296800-43-6, Lithium manganese nickel oxide  $LiO-1.2Mn_2O_4-1.2NiO-0.9O_4$  296800-45-8, Lithium manganese titanium oxide  $LiO-1.2Mn_2O_4-1.2TiO_2-0.9O_4$  296800-47-0, Lithium manganese zirconium oxide  $LiO-1.2Mn_2O_4-1.2ZrO_2-0.9O_4$  296800-49-2, Copper Lithium manganese oxide  $CuO-0.9LiO-1.2Mn_2O_4$  296800-51-6, Lithium manganese zinc oxide  $LiO-1.2Mn_2O_4-1.2ZnO-0.9O_4$  296800-52-7, Aluminum Lithium manganese oxide  $AlO-0.9LiO-1.2Mn_2O_4$  296800-54-9, Lead Lithium manganese oxide  $PbO-0.9LiO-1.2Mn_2O_4$  296800-56-1, Antimony Lithium manganese oxide  $SbO-0.9LiO-1.2Mn_2O_4$

RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte secondary battery)

L9 ANSWER 14 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2000:663608 CAPLUS

DOCUMENT NUMBER: 133:269424

TITLE: Manufacture of positive **electrode** for use in  
lithium secondary battery

INVENTOR(S): Nozaki, Ayumu; Miyashita, Shoji; Maekawa, Takeyuki;  
Uchikawa, Hideoki

PATENT ASSIGNEE(S): Mitsubishi Electric Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

|                        | PATENT NO.   | KIND  | DATE  | APPLICATION NO.   | DATE         |  |  |  |  |  |
|------------------------|--|---|---|---|--------------|--|--|--|--|--|
|                        | JP 2000260432  | A2  | 20000922  | JP 1999-61232   | 19990309     |  |  |  |  |  |
| PRIORITY APPLN. INFO.: |  |   |   | JP 1999-61232   | 19990309     |  |  |  |  |  |
| TI                     | Manufacture of positive <b>electrode</b> for use in lithium secondary battery  |   |   |   |              |  |  |  |  |  |
| AB                     | The pos. <b>electrode</b> has a general formula $\text{Li} \cdot \alpha \cdot \text{Mn}_{1-x-y} \text{A}_x \text{B}_y \text{O}_z$ where 1st metal A is selected from Mg, Al, Fe, Co, Ni, and Cu, 2nd metal B is selected from Ti, Zr, V, Nb, Ta, Mo, Re, W, and Ru, $0.5 \cdot \text{ltoreq} \cdot \alpha \cdot \text{ltoreq} \cdot 1$ , $0.01 \cdot \text{ltoreq} \cdot x$ , $0.01 \cdot \text{ltoreq} \cdot y$ , and $0.02 \cdot \text{ltoreq} \cdot x+y \cdot \text{ltoreq} \cdot 0.5$ . The <b>electrode</b> active material is manufd. by mixing lithium source, manganese source, 1st metal, and 2nd metal at a ratio of $0.5:(1-x-y):x:y$ in the presence of a complexing agent to form a complex soln., spray-drying the soln. to drive-off the solvent to obtain a precursor, and heat-treating the precursor. The material is used in the lithium secondary battery. |   |   |   |              |  |  |  |  |  |
| ST                     | lithium secondary battery pos <b>electrode</b> manuf   |   |   |   |              |  |  |  |  |  |
| IT                     | Battery cathodes<br>Secondary batteries<br>(manuf. of pos. <b>electrode</b> for use in lithium secondary battery)  |   |   |   |              |  |  |  |  |  |
| IT                     | 297177-63-0P   | 297177-64-1P  | 297177-65-2P  | 297177-66-3P  | 297177-67-4P |  |  |  |  |  |
|                        | 297177-68-5P   | 297177-69-6P  | 297177-70-9P  | 297177-71-0P  | 297177-72-1P |  |  |  |  |  |
|                        | 297177-73-2P   | 297177-74-3P  | 297177-75-4P  | Iron lithium manganese titanium oxide ( $\text{Fe}_{0.04}\text{Li}_{0.5}\text{Mn}_{0.92}\text{Ti}_{0.04}\text{O}_2$ ) |              |  |  |  |  |  |
|                        | 297177-76-5P   |   |   |   |              |  |  |  |  |  |
|                        | 297177-77-6P   | Iron lithium manganese zirconium oxide ( $\text{Fe}_{0.04}\text{Li}_{0.5}\text{Mn}_{0.92}\text{Zr}_{0.04}\text{O}_2$ )              |   |   |              |  |  |  |  |  |
|                        | 297177-78-7P   | 297177-79-8P  | Iron lithium manganese vanadium oxide ( $\text{Fe}_{0.05}\text{Li}_{0.5}\text{Mn}_{0.93}\text{V}_{0.02}\text{O}_2$ )    |   |              |  |  |  |  |  |
|                        | 297177-80-1P   | 297177-81-2P  | Iron lithium manganese vanadium oxide ( $\text{Fe}_{0.27}\text{Li}_{0.5}\text{Mn}_{0.51}\text{V}_{0.22}\text{O}_2$ )    |   |              |  |  |  |  |  |
|                        | 297177-82-3P   | Aluminum lithium manganese niobium oxide ( $\text{Al}_{0.05}\text{Li}_{0.5}\text{Mn}_{0.93}\text{Nb}_{0.02}\text{O}_2$ )            |   |   |              |  |  |  |  |  |
|                        | 297177-83-4P   | Iron lithium manganese niobium oxide ( $\text{Fe}_{0.05}\text{Li}_{0.5}\text{Mn}_{0.93}\text{Nb}_{0.02}\text{O}_2$ )                |   |   |              |  |  |  |  |  |
|                        | 297177-84-5P   | Aluminum lithium manganese niobium oxide ( $\text{Al}_{0.27}\text{Li}_{0.5}\text{Mn}_{0.51}\text{Nb}_{0.22}\text{O}_2$ )            |   |   |              |  |  |  |  |  |
|                        | 297177-85-6P   | Iron lithium manganese niobium oxide ( $\text{Fe}_{0.27}\text{Li}_{0.5}\text{Mn}_{0.51}\text{Nb}_{0.22}\text{O}_2$ )                |   |   |              |  |  |  |  |  |
|                        | 297177-86-7P   | 297177-87-8P, Iron lithium manganese tantalum oxide ( $\text{Fe}_{0.05}\text{Li}_{0.5}\text{Mn}_{0.93}\text{Ta}_{0.02}\text{O}_2$ ) |   |   |              |  |  |  |  |  |
|                        | 297177-88-9P   | 297177-89-0P  | Iron lithium manganese molybdenum oxide ( $\text{Fe}_{0.06}\text{Li}_{0.5}\text{Mn}_{0.92}\text{Mo}_{0.02}\text{O}_2$ ) |   |              |  |  |  |  |  |
|                        | 297177-90-3P   | Aluminum lithium manganese rhenium oxide ( $\text{Al}_{0.04}\text{Li}_{0.5}\text{Mn}_{0.92}\text{Re}_{0.04}\text{O}_2$ )            |   |   |              |  |  |  |  |  |
|                        | 297177-91-4P   | Iron lithium manganese rhenium oxide ( $\text{Fe}_{0.04}\text{Li}_{0.5}\text{Mn}_{0.92}\text{Re}_{0.04}\text{O}_2$ )                |   |   |              |  |  |  |  |  |
|                        | 297177-92-5P   | 297177-93-6P, Iron lithium manganese tungsten oxide ( $\text{Fe}_{0.06}\text{Li}_{0.5}\text{Mn}_{0.92}\text{W}_{0.02}\text{O}_2$ )  |   |   |              |  |  |  |  |  |
|                        | 297177-94-7P   | 297177-95-8P  | Iron lithium manganese ruthenium oxide ( $\text{Fe}_{0.04}\text{Li}_{0.5}\text{Mn}_{0.92}\text{Ru}_{0.04}\text{O}_2$ )  |   |              |  |  |  |  |  |
|                        | 297177-96-9P   | Cobalt lithium manganese vanadium oxide ( $\text{Co}_{0.27}\text{Li}_{0.5}\text{Mn}_{0.51}\text{V}_{0.22}\text{O}_2$ )              |   |   |              |  |  |  |  |  |
|                        | 297177-97-0P   | Lithium manganese   |   |   |              |  |  |  |  |  |

nickel vanadium oxide ( $\text{Li}_{0.5}\text{Mn}_{0.5}\text{Ni}_{0.25}\text{V}_{0.25}\text{O}_2$ ) 297177-98-1P, Copper  
lithium manganese vanadium oxide ( $\text{Cu}_{0.25}\text{Li}_{0.5}\text{Mn}_{0.5}\text{V}_{0.25}\text{O}_2$ ) 297177-99-2P,  
Iron lithium manganese vanadium oxide ( $\text{Fe}_{0.27}\text{LiMn}_{0.48}\text{V}_{0.25}\text{O}_2$ )  
297178-00-8P, Iron lithium manganese niobium oxide  
( $\text{Fe}_{0.27}\text{LiMn}_{0.48}\text{Nb}_{0.25}\text{O}_2$ )  
RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)  
(manuf. of pos. **electrode** for use in lithium secondary  
battery)

L9 ANSWER 15 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2000:486847 CAPLUS

DOCUMENT NUMBER: 133:137780

TITLE: Lithium nickelate electrodes with enhanced  
high-temperature performance and thermal stability

AUTHOR(S): Arai, H.; Tsuda, M.; Sakurai, Y.

CORPORATE SOURCE: NTT Telecommunications Energy Laboratories, Tokai,  
Ibaraki, 319-1193, Japan

SOURCE: Journal of Power Sources (2000), 90(1), 76-81

CODEN: JPSODZ; ISSN: 0378-7753

PUBLISHER: Elsevier Science S.A.

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AB Lithium nickelate is an attractive pos. **electrode** material for  
lithium ion batteries because of its large capacity at ambient temps.  
However, highly delithiated  $\text{LiNiO}_2$  (e.g.,  $\text{Li}_{0.2}\text{NiO}_2$ ) shows undesirable  
exothermal heat at 200.degree.. We found another issue of  $\text{LiNiO}_2$  in this  
study, namely poor reversibility at 40.degree.. To overcome these  
disadvantages, we introduced cobalt, manganese, and titanium as partial  
substituents for nickel. Cobalt substitution was effective in improving  
the reversibility at 40.degree.. The exothermal decompn. of the  
delithiated compds. was suppressed by using manganese and titanium as  
substituents. We found doubly substituted nickelate  $\text{LiNi}_{0.8}\text{Co}_{0.1}\text{Ti}_{0.1}\text{O}_2$   
to be the most promising in terms of large capacity (190 mA h g<sup>-1</sup>),  
enhanced high-temp. performance, and improved thermal stability.

IT 12031-65-1, Lithium nickel oxide  $\text{LiNiO}_2$  116327-69-6, Cobalt lithium  
nickel oxide  $\text{Co}_{0.1}\text{LiNi}_{0.9}\text{O}_2$  149887-20-7, Lithium manganese nickel oxide  
 $\text{LiMn}_{0.1}\text{Ni}_{0.9}\text{O}_2$  176661-45-3, Lithium nickel oxide  $\text{Li}_{0.2}\text{NiO}_2$   
179802-95-0, Cobalt lithium manganese nickel oxide  $\text{Co}_{0.1}\text{LiMn}_{0.1}\text{Ni}_{0.8}\text{O}_2$   
196313-89-0, Cobalt lithium nickel titanium oxide  $\text{Co}_{0.1}\text{LiNi}_{0.8}\text{Ti}_{0.1}\text{O}_2$   
198065-49-5, Lithium nickel titanium oxide  $\text{LiNi}_{0.9}\text{Ti}_{0.1}\text{O}_2$  225661-18-7,  
Cobalt lithium nickel oxide  $\text{Co}_{0.1}\text{Li}_{0.2}\text{Ni}_{0.9}\text{O}_2$  **225661-21-2**,  
Lithium manganese nickel oxide  $\text{Li}_{0.2}\text{Mn}_{0.1}\text{Ni}_{0.9}\text{O}_2$  286470-97-1, Lithium  
nickel titanium oxide ( $\text{Li}_{0.2}\text{Ni}_{0.9}\text{Ti}_{0.1}\text{O}_2$ ) **286470-98-2**, Cobalt  
lithium manganese nickel oxide ( $\text{Co}_{0.1}\text{Li}_{0.2}\text{Mn}_{0.1}\text{Ni}_{0.8}\text{O}_2$ )

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(lithium nickelate electrodes with enhanced high-temp. performance and  
thermal stability)

L9 ANSWER 16 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2000:101996 CAPLUS

DOCUMENT NUMBER: 132:188786

TITLE: Studies of the layered manganese bronzes,  
 $\text{Na}_{2/3}[\text{Mn}_{1-x}\text{Mx}]_2\text{O}_2$  with M = Co, Ni, Li, and  
 $\text{Li}_{2/3}[\text{Mn}_{1-x}\text{Mx}]_2\text{O}_2$  prepared by ion-exchange

AUTHOR(S): Paulsen, J. M.; Dahn, J. R.

CORPORATE SOURCE: Department of Physics, Dalhousie University, Halifax,  
NS, B3H 3J5, Can.

SOURCE: Solid State Ionics (1999), 126(1,2), 3-24

CODEN: SSIOD3; ISSN: 0167-2738

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English  
REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT Electric capacitance  
(sp. capacity of lithium cobalt manganese oxide as possible  
**electrode** for lithium cells)  
IT 249915-43-3P, Lithium manganese sodium oxide (Li0.17Mn0.83Na0.67O2)  
259190-84-6P, Cobalt manganese sodium oxide (Co0.3Mn0.7Na0.67O2)  
259190-85-7P, Manganese nickel sodium oxide (Mn0.95Ni0.05Na0.67O2)  
259190-86-8P, Manganese nickel sodium oxide (Mn0.7Ni0.3Na0.67O2)  
**259190-87-9P**, Lithium manganese nickel oxide  
(Li0.67Mn0.67Ni0.33O2)  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(bronze; prepn. and XRD of)  
IT 249915-56-8P, Cobalt lithium manganese oxide (Co0.15Li0.67Mn0.85O2)  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(bronze; prepn., XRD, and specific capacity as **electrode** for  
Li cell)

L9 ANSWER 17 OF 18 CAPLUS COPYRIGHT 2003 ACS  
ACCESSION NUMBER: 1995:309020 CAPLUS  
DOCUMENT NUMBER: 122:85452  
TITLE: Manufacture of lithium and transition metal mixed  
oxides, the oxides obtained, and their use as negative  
**electrode** in secondary batteries  
INVENTOR(S): Yazami, Rachid; Pastor, Henri; Bonneau, Maxime  
PATENT ASSIGNEE(S): Centre National de la Recherche Scientifique, Fr.;  
Eurotungstene Poudres  
SOURCE: PCT Int. Appl., 28 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: French  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.   | KIND   | DATE     | APPLICATION NO. | DATE     |
|--|--|----------|-----------------|----------|
| WO 9425398   | A1   | 19941110 | WO 1994-FR460   | 19940422 |
| W: CA, FI, JP, KR, US  |  |          |                 |          |
| RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE |  |          |                 |          |
| FR 2704216   | A1   | 19941028 | FR 1993-4807    | 19930423 |
| PRIORITY APPLN. INFO.:   |  |          | FR 1993-4807    | 19930423 |
| TI   | Manufacture of lithium and transition metal mixed oxides, the oxides<br>obtained, and their use as negative <b>electrode</b> in secondary<br>batteries   |          |                 |          |
| ST   | lithium transition metal oxide <b>electrode</b> ; neg <b>electrode</b><br>secondary lithium battery; cobalt lithium oxide <b>electrode</b> ;<br>manganese nickel lithium oxide <b>electrode</b>  |          |                 |          |
| IT   | 7439-89-6P, Iron, uses 7439-96-5P, Manganese, uses 7439-98-7P,<br>Molybdenum, uses 7440-02-0P, Nickel, uses 7440-03-1P, Niobium, uses<br>7440-15-5P, Rhenium, uses 7440-25-7P, Tantalum, uses 7440-32-6P,<br>Titanium, uses 7440-33-7P, Tungsten, uses 7440-47-3P, Chromium, uses<br>7440-48-4P, Cobalt, uses 7440-62-2P, Vanadium, uses 7440-67-7P,<br>Zirconium, uses 52627-24-4P, Cobalt lithium oxide 160407-63-6P, Cobalt<br>lithium nickel oxide (Co0.3Li0-1Ni0.7O2) 160407-64-7P, Cobalt lithium<br>nickel oxide (Co0.2Li0-1Ni0.8O2) <b>160407-65-8P</b> , Lithium manganese<br>nickel oxide (Li0-1Mn0.5Ni0.5O2)<br>RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical<br>process); TEM (Technical or engineered material use); PREP (Preparation);<br>PROC (Process); USES (Uses)<br>(wet process for the manuf. of lithium and transition metal mixed<br>oxides for neg. electrodes in secondary lithium batteries) |          |                 |          |

L9 ANSWER 18 OF 18 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1994:303355 CAPLUS  
DOCUMENT NUMBER: 120:303355  
TITLE: Lithium secondary battery  
INVENTOR(S): Idota, Yoshio; Kagawa, Okimasa; Yasunami, Shoichiro  
PATENT ASSIGNEE(S): Fuji Photo Film Co Ltd, Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|-------------|------|----------|-----------------|----------|
| JP 06044972 | A2   | 19940218 | JP 1992-197057  | 19920723 |

PRIORITY APPLN. INFO.: JP 1992-197057 19920723

ST battery **electrode** lithium transition metal oxide

IT 155274-12-7, Cobalt lithium vanadium oxide (Co0.95LiV0.05O2.07)  
155329-13-8, Cobalt lithium oxide (CoLi0.4-1.1O2) 155329-14-9, Cobalt  
lithium nickel oxide (Co0.1-0.9Li0.4-1.1Ni0.1-0.9O2) 155329-15-0, Cobalt  
lithium vanadium oxide (Co0.8-0.98Li0.4-1.1V0.02-0.2O1.5-5) 155329-16-1,  
Cobalt iron lithium oxide (Co0.8-0.98Fe0.02-0.2Li0.4-1.1O1.5-5)  
155329-17-2, Lithium manganese oxide (Li0.4-1.1Mn2O4) 155329-18-3,  
Cobalt lithium manganese oxide (Co1.02-1.2Li0.4-1.1Mn0.8-0.98O1.5-5)  
155329-19-4, Lithium manganese nickel oxide (Li0.4-1.1Mn0.8-  
0.98Ni1.02-1.2O1.5-5) 155329-20-7, Lithium manganese vanadium oxide  
(Li0.4-1.1Mn0.8-0.98V1.02-1.2O1.5-5) 155329-21-8, Iron lithium  
manganese oxide (Fe1.02-1.2Li0.4-1.1Mn0.8-0.98O1.5-5)  
RL: DEV (Device component use); USES (Uses)  
(cathodes contg., for lithium secondary batteries)

=> s 18 not 19  
L10 28 L8 NOT L9

=> s 110 and battery  
98634 BATTERY  
L11 21 L10 AND BATTERY

=> d 110 1-28 ibib kwic

L10 ANSWER 1 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2003:97138 CAPLUS  
DOCUMENT NUMBER: 138:156266  
TITLE: Production of lithium nickel manganese compound oxides  
for secondary lithium battery cathodes by firing their  
raw material mixtures  
INVENTOR(S): Kikuchi, Kazuhiro; Tsurita, Yasushi  
PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.    | KIND | DATE     | APPLICATION NO. | DATE     |
|---------------|------|----------|-----------------|----------|
| JP 2003034538 | A2   | 20030207 | JP 2002-138827  | 20020514 |

PRIORITY APPLN. INFO.: JP 2001-147662 A 20010517  
JP 2001-147663 A 20010517  
JP 2001-147664 A 20010517

IT 495464-12-5P  
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP

(Preparation); USES (Uses)

(battery cathodes; prodn. of lithium nickel manganese compd. oxides for secondary lithium battery cathodes by firing of raw material mixts. contg. powder obtained by spray atomization of slurries)

L10 ANSWER 2 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2003:93990 CAPLUS

DOCUMENT NUMBER: 138:156241

TITLE: Production of layered lithium nickel manganese compound oxide powder with high bulk density for secondary lithium battery cathodes

INVENTOR(S): Kikuchi, Kazuhiro; Shima, Koji

PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.             | KIND | DATE     | APPLICATION NO. | DATE     |
|------------------------|------|----------|-----------------|----------|
| JP 2003034537          | A2   | 20030207 | JP 2001-218996  | 20010719 |
| PRIORITY APPLN. INFO.: |      |          | JP 2001-218996  | 20010719 |

IT 162684-16-4P, Lithium manganese nickel oxide **495464-12-5P**

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)

(powder, battery cathodes; prodn. of layered lithium nickel manganese compd. oxide powder with high bulk d. for secondary lithium battery cathodes by applying compressive shear stress)

L10 ANSWER 3 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:518139 CAPLUS

DOCUMENT NUMBER: 137:96242

TITLE: Lithium manganese mixed oxide cathode active mass and secondary nonaqueous-electrolyte battery using it

INVENTOR(S): Yugamidani, Makoto; Ota, Satoshi; Yamato, Koji; Hayashi, Koji; Kitamura, Hajime; Miyashita, Takahiro

PATENT ASSIGNEE(S): Chuo Denki Kogyo Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.             | KIND | DATE     | APPLICATION NO. | DATE     |
|------------------------|------|----------|-----------------|----------|
| JP 2002198052          | A2   | 20020712 | JP 2000-397911  | 20001227 |
| PRIORITY APPLN. INFO.: |      |          | JP 2000-397911  | 20001227 |

IT **441769-91-1P**, Lithium manganese nickel oxide (Li<sub>0.28</sub>Mn<sub>0.95</sub>Ni<sub>0.05</sub>O<sub>2</sub>)

RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(Li-Mn mixed oxide cathode active mass for nonaq.-electrolyte battery for high discharge capacity and)

L10 ANSWER 4 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:503996 CAPLUS

DOCUMENT NUMBER: 137:65734

TITLE: Anode carbon material and its manufacture for secondary nonaqueous-solvent battery

INVENTOR(S): Uemura, Ryuzo; Osawa, Yasuhiko

PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

| PATENT NO.   | KIND | DATE     | APPLICATION NO. | DATE     |
|--|------|----------|-----------------|----------|
| JP 2002190301  | A2   | 20020705 | JP 2000-389236  | 20001221 |
| PRIORITY APPLN. INFO.: JP 2000-389236 20001221                           |      |          |                 |          |
| IT 180742-68-1, Lithium manganese potassium oxide (Li0.8MnK0.2O2)        |      |          |                 |          |
| 247918-52-1, Lithium manganese sodium oxide (Li0.9MnNa0.1O2)             |      |          |                 |          |
| 259190-87-9D, Lithium manganese nickel oxide                             |      |          |                 |          |
| (Li0.67Mn0.67Ni0.33O2), oxygen-deficient 284485-63-8, Lithium manganese  |      |          |                 |          |
| sodium oxide (Li0.8MnNa0.2O2) 284485-72-9, Lithium manganese potassium   |      |          |                 |          |
| oxide (Li0.9MnK0.1O2) 297173-44-5D, Iron lithium manganese oxide         |      |          |                 |          |
| (Fe0.33Li0.67Mn0.67O2), oxygen-deficient 356786-63-5D, Cobalt Lithium    |      |          |                 |          |
| Manganese oxide (Co0.5Li0.67Mn0.5O2), oxygen-deficient 356786-64-6D,     |      |          |                 |          |
| Cobalt Lithium Manganese oxide (Co0.5Li0.83Mn0.5O2), oxygen-deficient    |      |          |                 |          |
| 356786-65-7D, Cobalt lithium manganese oxide (Co0.5Li0.97Mn0.5O2),       |      |          |                 |          |
| oxygen-deficient 356786-66-8D, Cobalt Lithium Manganese oxide            |      |          |                 |          |
| (Co0.25Li0.75Mn0.75O2), oxygen-deficient 356786-67-9D, Lithium Manganese |      |          |                 |          |
| Nickel oxide (Li0.83Mn0.75Ni0.25O2), oxygen-deficient 356786-68-0D, Iron |      |          |                 |          |
| lithium manganese oxide (Fe0.33Li0.83Mn0.67O2), oxygen-deficient         |      |          |                 |          |
| 356786-69-1D, Aluminum lithium manganese oxide (Al0.25Li0.83Mn0.75O2),   |      |          |                 |          |
| oxygen-deficient 356786-70-4D, Chromium lithium manganese oxide          |      |          |                 |          |
| (Cr0.25Li0.83Mn0.75O2), oxygen-deficient 356786-75-9D, Iron              |      |          |                 |          |
| lithium manganese oxide (Fe0.12Li0.75Mn0.88O2), oxygen-deficient         |      |          |                 |          |
| 356786-76-0D, Lithium manganese niobium oxide (Li0.83Mn0.75Nb0.25O2),    |      |          |                 |          |
| oxygen-deficient 356786-77-1D, Lithium manganese tantalum oxide          |      |          |                 |          |
| (Li0.83Mn0.75Ta0.25O2), oxygen-deficient 356786-78-2D, Lithium manganese |      |          |                 |          |
| titanium oxide (Li0.83Mn0.75Ti0.25O2), oxygen-deficient 357425-06-0,     |      |          |                 |          |
| Lithium manganese silver oxide (Li0.8MnAg0.2O2) 357425-08-2, Lithium     |      |          |                 |          |
| manganese silver oxide (Li0.9MnAg0.1O2) 357425-11-7, Cobalt lithium      |      |          |                 |          |
| manganese sodium oxide (Co0.5Li0.9Mn0.5Na0.1O2) 357425-14-0, Iron        |      |          |                 |          |
| lithium manganese sodium oxide (Fe0.25Li0.9Mn0.75Na0.1O2) 357425-16-2,   |      |          |                 |          |
| Lithium manganese nickel sodium oxide (Li0.9Mn0.75Ni0.25Na0.1O2)         |      |          |                 |          |
| 357425-19-5, Chromium lithium manganese silver oxide                     |      |          |                 |          |
| (Cr0.5Li0.9Mn0.5Ag0.1O2) 357425-21-9, Aluminum lithium manganese sodium  |      |          |                 |          |
| oxide (Al0.25Li0.9Mn0.75Na0.1O2) 357425-23-1, Gallium lithium manganese  |      |          |                 |          |
| sodium oxide (Ga0.17Li0.9Mn0.83Na0.1O2) 357425-25-3, Indium lithium      |      |          |                 |          |
| manganese sodium oxide (In0.12Li0.9Mn0.88Na0.1O2) 439811-50-4D, Gallium  |      |          |                 |          |
| lithium manganese oxide (Ga0.25Li0.88Mn0.75O2), oxygen-deficient         |      |          |                 |          |
| 439811-51-5D, Indium lithium manganese oxide (In0.25Li0.88Mn0.75O2),     |      |          |                 |          |
| oxygen-deficient 439811-52-6D, Lithium manganese zirconium oxide         |      |          |                 |          |
| (Li0.88Mn0.75Zr0.25O2), oxygen-deficient 439811-53-7D, Lithium manganese |      |          |                 |          |
| vanadium oxide (Li0.88Mn0.75V0.25O2), oxygen-deficient 439811-54-8D,     |      |          |                 |          |
| Chromium lithium manganese oxide (Cr0.5Li0.67Mn0.5O2), oxygen-deficient  |      |          |                 |          |
| 439811-55-9D, Iron lithium manganese oxide (Fe0.5Li0.67Mn0.5O2),         |      |          |                 |          |
| oxygen-deficient 439811-56-0D, Lithium manganese nickel oxide            |      |          |                 |          |
| (Li0.67Mn0.5Ni0.5O2), oxygen-deficient                                   |      |          |                 |          |
| RL: DEV (Device component use); USES (Uses)                              |      |          |                 |          |
| (cathode; manuf. of anode contg. specified carbon material having        |      |          |                 |          |
| 6-membered ring structure for nonaq. battery)                            |      |          |                 |          |

L10 ANSWER 5 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:486410 CAPLUS

DOCUMENT NUMBER: 137:65701

TITLE: Cathode active mass containing lithium nickel cobalt  
 manganese fluoride oxide and secondary lithium battery

INVENTOR(S): Odakawa, Kenji

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.



DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.                                | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| JP 2002184402                             | A2   | 20020628 | JP 2000-375938  | 20001211 |
| PRIORITY APPLN. INFO.:<br>IT 439585-71-4P |      |          | JP 2000-375938  | 20001211 |

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)  
(cathode active mass contg. lithium nickel cobalt manganese fluoride oxide for lithium battery)

L10 ANSWER 6 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:420728 CAPLUS  
DOCUMENT NUMBER: 137:281750  
TITLE: Synthesis and electrochemical characteristics of Li<sub>0.7</sub>[Ni<sub>0.05</sub>Mn<sub>0.95</sub>]O<sub>2</sub> as a positive material for rechargeable lithium batteries  
AUTHOR(S): Shin, Sun-Sik; Kim, Dong-Won; Sun, Yang-Kook  
CORPORATE SOURCE: Department of Chemical Engineering, Hanyang University, Seoul, 133-791, S. Korea  
SOURCE: Bulletin of the Korean Chemical Society (2002), 23(5), 679-682  
CODEN: BKCSDE; ISSN: 0253-2964  
PUBLISHER: Korean Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT 466697-19-8P, Lithium manganese nickel oxide (Li<sub>0.7</sub>Mn<sub>0.95</sub>Ni<sub>0.05</sub>O<sub>2</sub>)  
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)  
(battery cathode; synthesis and electrochem. characteristics of Li<sub>0.7</sub>[Ni<sub>0.05</sub>Mn<sub>0.95</sub>]O<sub>2</sub> as cathode material for rechargeable lithium batteries)

L10 ANSWER 7 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2001:692232 CAPLUS  
DOCUMENT NUMBER: 135:259780  
TITLE: Lithium mixed oxide cathodes for secondary lithium batteries, and their preparation  
INVENTOR(S): Chung, Hyun Sook; Kim, Geun Bae; Cho, Jae Pil  
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea  
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.             | KIND | DATE     | APPLICATION NO. | DATE       |
|------------------------|------|----------|-----------------|------------|
| JP 2001256978          | A2   | 20010921 | JP 2001-28951   | 20010206   |
| US 2001031399          | A1   | 20011018 | US 2001-775315  | 20010131   |
| PRIORITY APPLN. INFO.: |      |          | KR 2000-6854    | A 20000214 |
|                        |      |          | KR 2000-26267   | A 20000517 |

IT 12057-17-9, Lithium manganese oxide (LiMn<sub>2</sub>O<sub>4</sub>) 130242-31-8, Lithium manganese oxide (Li<sub>1.05</sub>Mn<sub>2</sub>O<sub>4</sub>) 361443-86-9, Cobalt lithium nickel oxide (Co<sub>0.18</sub>Li<sub>0.98</sub>Ni<sub>0.82</sub>O<sub>2</sub>) 361443-87-0, Lithium manganese nickel oxide

(Li<sub>1.03</sub>Mn<sub>0.2</sub>Ni<sub>0.802</sub>) **361443-88-1**, Lithium manganese nickel oxide  
(Li<sub>0</sub>-1.3Mn<sub>0.1</sub>-0.4Ni<sub>0.6</sub>-0.9O<sub>2</sub>-2.5) **361443-89-2**, Lithium manganese oxide  
(Li<sub>1</sub>-1.3Mn<sub>1.7</sub>-2O<sub>3</sub>-5-4) **361443-91-6**, Lithium manganese oxide  
(Li<sub>1</sub>-1.3Mn<sub>1.7</sub>-2O<sub>4</sub>-4.5)  
RL: DEV (Device component use); USES (Uses)  
(cathode component; prepn. of lithium mixed oxide cathodes for  
secondary Li batteries)

L10 ANSWER 8 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2001:568949 CAPLUS  
DOCUMENT NUMBER: 135:306156  
TITLE: Influence of soaking in the molten (Li<sub>0.62</sub>K<sub>0.38</sub>)<sub>2</sub>CO<sub>3</sub>  
eutectic on the structure and conductivity of  
LiMn<sub>x</sub>Fe<sub>1-x</sub>O<sub>2</sub> and Li<sub>1-y</sub>Mn<sub>y</sub>FeO<sub>2+δ</sub>.  
AUTHOR(S): Vecherskii, S. I.; Esina, N. O.; Batalov, N. N.  
CORPORATE SOURCE: Inst. High-Temp. Electrochemistry, Russian Acad. Sci.,  
Yekaterinburg, 620219, Russia  
SOURCE: Inorganic Materials (Translation of Neorganicheskie  
Materialy) (2001), 37(7), 744-749  
CODEN: INOMAF; ISSN: 0020-1685  
PUBLISHER: MAIK Nauka/Interperiodica Publishing  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT **367267-66-1**, Iron lithium manganese oxide (Fe(Li,Mn)O<sub>2</sub>)  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(oxygen-excess; influence of soaking in the molten (Li<sub>0.62</sub>K<sub>0.38</sub>)<sub>2</sub>CO<sub>3</sub>  
eutectic on the structure and cond. of LiMn<sub>x</sub>Fe<sub>1-x</sub>O<sub>2</sub> and  
Li<sub>1-y</sub>Mn<sub>y</sub>FeO<sub>2+δ</sub>.)

L10 ANSWER 9 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2001:345062 CAPLUS  
DOCUMENT NUMBER: 135:100066  
TITLE: Effects of Stacking Fault Defects on the X-ray  
Diffraction Patterns of T<sub>2</sub>, O<sub>2</sub>, and O<sub>6</sub> Structure  
Li<sub>2/3</sub>[Co<sub>x</sub>Ni<sub>1/3-x</sub>Mn<sub>2/3</sub>]O<sub>2</sub>  
AUTHOR(S): Lu, Zhonghua; Dahn, J. R.  
CORPORATE SOURCE: Departments of Physics and Chemistry, Dalhousie  
University, Halifax, NS, B3H 3J5, Can.  
SOURCE: Chemistry of Materials (2001), 13(6), 2078-2083  
CODEN: CMATEX; ISSN: 0897-4756  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT **259190-87-9**, Lithium manganese nickel oxide (Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
**310450-24-9**, Cobalt lithium manganese nickel oxide  
(Co<sub>0.04</sub>Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.29</sub>O<sub>2</sub>) **310450-26-1**, Cobalt lithium  
manganese nickel oxide (Co<sub>0.08</sub>Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.25</sub>O<sub>2</sub>) **349140-87-0**,  
Cobalt lithium manganese nickel oxide ((Co,Ni)<sub>0.33</sub>Li<sub>0.67</sub>Mn<sub>0.67</sub>O<sub>2</sub>)  
RL: PRP (Properties)  
(effects of stacking fault defects on x-ray diffraction patterns of T<sub>2</sub>,  
O<sub>2</sub>, and O<sub>6</sub> structure Li<sub>2/3</sub>[Co<sub>x</sub>Ni<sub>1/3-x</sub>Mn<sub>2/3</sub>]O<sub>2</sub>)

L10 ANSWER 10 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2001:312830 CAPLUS  
DOCUMENT NUMBER: 135:98793  
TITLE: Relationship between Chemical Bonding Character and  
Electrochemical Performance in Nickel-Substituted  
Lithium Manganese Oxides  
AUTHOR(S): Park, Hyo-Suk; Hwang, Seong-Ju; Choy, Jin-Ho  
CORPORATE SOURCE: National Nanohybrid Materials Laboratory School of

SOURCE: Chemistry and Molecular Engineering, Seoul National University, Seoul, 151-747, S. Korea  
Journal of Physical Chemistry B (2001), 105(21), 4860-4866  
CODEN: JPCBFK; ISSN: 1089-5647  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT 349552-27-8, Lithium manganese hydroxide oxide ( $\text{Li}_{0.36}\text{Mn}_{0.89}(\text{OH})_{0.25}\text{O}_{1.75}$ )  
349552-28-9, Lithium manganese nickel hydroxide oxide ( $\text{Li}_{0.53}\text{Mn}_{0.97}\text{Ni}_{0.03}(\text{OH})_{0.11}\text{O}_{1.89}$ ) 349552-29-0, Lithium manganese nickel hydroxide oxide ( $\text{Li}_{0.57}\text{Mn}_{0.94}\text{Ni}_{0.06}(\text{OH})_{0.08}\text{O}_{1.92}$ )  
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); FORM (Formation, nonpreparative); PROC (Process); RACT (Reactant or reagent)  
(formation in chem. cycling and crystal structure: relationship between chem. bonding character and electrochem. performance in nickel-substituted lithium manganese oxides)

L10 ANSWER 11 OF 28 CAPLUS COPYRIGHT 2003 ACS  
ACCESSION NUMBER: 2001:186099 CAPLUS  
DOCUMENT NUMBER: 134:375247  
TITLE: Intercalation of Water in P2, T2 and O2 Structure  
 $\text{Az}[\text{Co}_x\text{Ni}_{1/3-x}\text{Mn}_{2/3}]\text{O}_2$   
AUTHOR(S): Lu, Zhonghua; Dahn, J. R.  
CORPORATE SOURCE: Department of Physics and Department of Chemistry, Dalhousie University, Halifax, NS, B3H 3J5, Can.  
SOURCE: Chemistry of Materials (2001), 13(4), 1252-1257  
CODEN: CMATEX; ISSN: 0897-4756  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT 259190-87-9P, Lithium manganese nickel oxide ( $\text{Li}_{0.67}\text{Mn}_{0.67}\text{Ni}_{0.33}\text{O}_2$ ) 285978-99-6P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.17}\text{Li}_{0.67}\text{Mn}_{0.67}\text{Ni}_{0.17}\text{O}_2$ )  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and attempted intercalation of water)

L10 ANSWER 12 OF 28 CAPLUS COPYRIGHT 2003 ACS  
ACCESSION NUMBER: 2001:181096 CAPLUS  
DOCUMENT NUMBER: 134:210559  
TITLE: Secondary lithium batteries  
INVENTOR(S): Honbo, Akiko; Goto, Akihiro; Muranaka, Kiyoshi  
PATENT ASSIGNEE(S): Hitachi, Ltd., Japan; Hitachi Maxell, Ltd.  
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.   | KIND | DATE     | APPLICATION NO. | DATE     |
|--|------|----------|-----------------|----------|
| JP 2001068168  | A2   | 20010316 | JP 1999-245071  | 19990831 |
| PRIORITY APPLN. INFO.:   |      |          | JP 1999-245071  | 19990831 |
| IT 328408-82-8, Cobalt germanium lithium nickel oxide ( $\text{Co}_{0.7}\text{Ge}_{0.2}\text{Li}_{0.1}\text{Ni}_{0.1}\text{O}_2$ ) |      |          |                 |          |
| 328408-83-9, Cobalt germanium lithium nickel oxide ( $\text{Co}_{0.7}\text{Ge}_{0.1}\text{Li}_{0.1}\text{Ni}_{0.2}\text{O}_2$ )    |      |          |                 |          |
| 328408-84-0, Cobalt germanium lithium nickel oxide ( $\text{Co}_{0.7}\text{Ge}_{0.05}\text{Li}_{0.1}\text{Ni}_{0.25}\text{O}_2$ )  |      |          |                 |          |
| 328408-85-1, Cobalt germanium lithium nickel oxide ( $\text{Co}_{0.7}\text{Ge}_{0.01}\text{Li}_{0.1}\text{Ni}_{0.29}\text{O}_2$ )  |      |          |                 |          |
| 328408-86-2, Cobalt germanium  |      |          |                 |          |

lithium nickel oxide (Co<sub>0.95</sub>Ge<sub>0.01</sub>Li<sub>0-1.2</sub>Ni<sub>0.04</sub>O<sub>2</sub>) 328408-87-3, Cobalt  
 germanium lithium nickel oxide (Co<sub>0.85</sub>Ge<sub>0.05</sub>Li<sub>0-1.2</sub>Ni<sub>0.1</sub>O<sub>2</sub>) 328408-88-4,  
 Cobalt lithium nickel titanium oxide (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.1</sub>Ti<sub>0.2</sub>O<sub>2</sub>)  
 328408-89-5, Cobalt lithium nickel titanium oxide (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.2</sub>Ti<sub>0.1</sub>O<sub>2</sub>) 328408-90-8, Cobalt lithium nickel titanium oxide  
 (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.25</sub>Ti<sub>0.05</sub>O<sub>2</sub>) 328408-91-9, Cobalt lithium nickel titanium  
 oxide (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.29</sub>Ti<sub>0.01</sub>O<sub>2</sub>) 328408-92-0, Cobalt lithium nickel  
 titanium oxide (Co<sub>0.95</sub>Li<sub>0-1.2</sub>Ni<sub>0.04</sub>Ti<sub>0.01</sub>O<sub>2</sub>) 328408-93-1, Cobalt lithium  
 nickel titanium oxide (Co<sub>0.85</sub>Li<sub>0-1.2</sub>Ni<sub>0.1</sub>Ti<sub>0.05</sub>O<sub>2</sub>) 328408-94-2, Cobalt  
 lithium nickel zirconium oxide (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.1</sub>Zr<sub>0.2</sub>O<sub>2</sub>) 328408-95-3,  
 Cobalt lithium nickel zirconium oxide (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.2</sub>Zr<sub>0.1</sub>O<sub>2</sub>)  
 328408-96-4, Cobalt lithium nickel zirconium oxide (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.25</sub>Zr<sub>0.05</sub>O<sub>2</sub>) 328408-97-5, Cobalt lithium nickel zirconium oxide  
 (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.29</sub>Zr<sub>0.01</sub>O<sub>2</sub>) 328408-98-6, Cobalt lithium nickel  
 zirconium oxide (Co<sub>0.95</sub>Li<sub>0-1.2</sub>Ni<sub>0.04</sub>Zr<sub>0.01</sub>O<sub>2</sub>) 328408-99-7, Cobalt  
 lithium nickel zirconium oxide (Co<sub>0.85</sub>Li<sub>0-1.2</sub>Ni<sub>0.1</sub>Zr<sub>0.05</sub>O<sub>2</sub>) 328409-00-3,  
 Cobalt lithium nickel yttrium oxide (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.1</sub>Y<sub>0.2</sub>O<sub>2</sub>)  
 328409-01-4, Cobalt lithium nickel yttrium oxide (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.2</sub>Y<sub>0.1</sub>O<sub>2</sub>)  
 328409-02-5, Cobalt lithium nickel yttrium oxide (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.25</sub>Y<sub>0.05</sub>O<sub>2</sub>) 328409-03-6, Cobalt lithium nickel yttrium oxide  
 (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.29</sub>Y<sub>0.01</sub>O<sub>2</sub>) 328409-04-7, Cobalt lithium nickel yttrium  
 oxide (Co<sub>0.95</sub>Li<sub>0-1.2</sub>Ni<sub>0.04</sub>Y<sub>0.01</sub>O<sub>2</sub>) 328409-05-8, Cobalt lithium nickel  
 yttrium oxide (Co<sub>0.85</sub>Li<sub>0-1.2</sub>Ni<sub>0.1</sub>Y<sub>0.05</sub>O<sub>2</sub>) 328409-06-9, Cobalt lithium  
 nickel oxide silicate (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.1</sub>O<sub>1.2</sub>(SiO<sub>4</sub>)<sub>0.2</sub>) 328409-07-0,  
 Cobalt lithium nickel oxide silicate (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.2</sub>O<sub>1.6</sub>(SiO<sub>4</sub>)<sub>0.1</sub>)  
 328409-08-1, Cobalt lithium nickel oxide silicate (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.25</sub>O<sub>1.8</sub>(SiO<sub>4</sub>)<sub>0.05</sub>) 328409-09-2, Cobalt lithium nickel oxide  
 silicate (Co<sub>0.7</sub>Li<sub>0-1.2</sub>Ni<sub>0.29</sub>O<sub>1.96</sub>(SiO<sub>4</sub>)<sub>0.01</sub>) 328409-10-5, Cobalt lithium  
 nickel oxide silicate (Co<sub>0.95</sub>Li<sub>0-1.2</sub>Ni<sub>0.04</sub>O<sub>1.96</sub>(SiO<sub>4</sub>)<sub>0.01</sub>) 328409-11-6,  
 Cobalt lithium nickel oxide silicate (Co<sub>0.85</sub>Li<sub>0-1.2</sub>Ni<sub>0.1</sub>O<sub>1.8</sub>(SiO<sub>4</sub>)<sub>0.05</sub>)  
 328409-12-7, Cobalt iron lithium oxide silicate (Co<sub>0.7</sub>Fe<sub>0.2</sub>Li<sub>0-1.2</sub>O<sub>1.6</sub>(SiO<sub>4</sub>)<sub>0.1</sub>) 328409-13-8, Cobalt iron lithium oxide silicate  
 (Co<sub>0.7</sub>Fe<sub>0.1</sub>Li<sub>0-1.2</sub>O<sub>1.2</sub>(SiO<sub>4</sub>)<sub>0.2</sub>) 328409-14-9, Cobalt iron lithium oxide  
 silicate (Co<sub>0.7</sub>Fe<sub>0.25</sub>Li<sub>0-1.2</sub>O<sub>1.8</sub>(SiO<sub>4</sub>)<sub>0.05</sub>) 328409-15-0, Cobalt iron  
 lithium oxide silicate (Co<sub>0.7</sub>Fe<sub>0.29</sub>Li<sub>0-1.2</sub>O<sub>1.96</sub>(SiO<sub>4</sub>)<sub>0.01</sub>) 328409-16-1,  
 Cobalt iron lithium oxide silicate (Co<sub>0.95</sub>Fe<sub>0.04</sub>Li<sub>0-1.2</sub>O<sub>1.96</sub>(SiO<sub>4</sub>)<sub>0.01</sub>)  
 328409-17-2, Cobalt iron lithium oxide silicate (Co<sub>0.85</sub>Fe<sub>0.1</sub>Li<sub>0-1.2</sub>O<sub>1.8</sub>(SiO<sub>4</sub>)<sub>0.05</sub>) 328409-18-3, Cobalt iron lithium yttrium oxide  
 (Co<sub>0.7</sub>Fe<sub>0.1</sub>Li<sub>0-1.2</sub>Y<sub>0.2</sub>O<sub>2</sub>) 328409-19-4, Cobalt iron lithium yttrium oxide  
 (Co<sub>0.7</sub>Fe<sub>0.2</sub>Li<sub>0-1.2</sub>Y<sub>0.1</sub>O<sub>2</sub>) 328409-20-7, Cobalt iron lithium yttrium oxide  
 (Co<sub>0.7</sub>Fe<sub>0.25</sub>Li<sub>0-1.2</sub>Y<sub>0.05</sub>O<sub>2</sub>) 328409-21-8, Cobalt iron lithium yttrium  
 oxide (Co<sub>0.7</sub>Fe<sub>0.29</sub>Li<sub>0-1.2</sub>Y<sub>0.01</sub>O<sub>2</sub>) 328409-22-9, Cobalt iron lithium  
 yttrium oxide (Co<sub>0.95</sub>Fe<sub>0.04</sub>Li<sub>0-1.2</sub>Y<sub>0.01</sub>O<sub>2</sub>) 328409-23-0, Cobalt iron  
 lithium yttrium oxide (Co<sub>0.85</sub>Fe<sub>0.1</sub>Li<sub>0-1.2</sub>Y<sub>0.05</sub>O<sub>2</sub>) 328409-24-1, Cobalt  
 iron lithium zirconium oxide (Co<sub>0.7</sub>Fe<sub>0.1</sub>Li<sub>0-1.2</sub>Zr<sub>0.2</sub>O<sub>2</sub>) 328409-25-2,  
 Cobalt iron lithium zirconium oxide (Co<sub>0.7</sub>Fe<sub>0.2</sub>Li<sub>0-1.2</sub>Zr<sub>0.1</sub>O<sub>2</sub>)  
 328409-26-3, Cobalt iron lithium zirconium oxide (Co<sub>0.7</sub>Fe<sub>0.25</sub>Li<sub>0-1.2</sub>Zr<sub>0.05</sub>O<sub>2</sub>) 328409-27-4, Cobalt iron lithium zirconium oxide  
 (Co<sub>0.7</sub>Fe<sub>0.29</sub>Li<sub>0-1.2</sub>Zr<sub>0.01</sub>O<sub>2</sub>) 328409-28-5, Cobalt iron lithium zirconium  
 oxide (Co<sub>0.95</sub>Fe<sub>0.04</sub>Li<sub>0-1.2</sub>Zr<sub>0.01</sub>O<sub>2</sub>) 328409-29-6, Cobalt iron lithium  
 zirconium oxide (Co<sub>0.85</sub>Fe<sub>0.1</sub>Li<sub>0-1.2</sub>Zr<sub>0.05</sub>O<sub>2</sub>) 328409-30-9, Cobalt iron  
 lithium titanium oxide (Co<sub>0.7</sub>Fe<sub>0.1</sub>Li<sub>0-1.2</sub>Ti<sub>0.2</sub>O<sub>2</sub>) 328409-31-0, Cobalt  
 iron lithium titanium oxide (Co<sub>0.7</sub>Fe<sub>0.2</sub>Li<sub>0-1.2</sub>Ti<sub>0.1</sub>O<sub>2</sub>) 328409-32-1,  
 Cobalt iron lithium titanium oxide (Co<sub>0.7</sub>Fe<sub>0.25</sub>Li<sub>0-1.2</sub>Ti<sub>0.05</sub>O<sub>2</sub>)  
 328409-33-2, Cobalt iron lithium titanium oxide (Co<sub>0.7</sub>Fe<sub>0.29</sub>Li<sub>0-1.2</sub>Ti<sub>0.01</sub>O<sub>2</sub>) 328409-34-3, Cobalt iron lithium titanium oxide  
 (Co<sub>0.95</sub>Fe<sub>0.04</sub>Li<sub>0-1.2</sub>Ti<sub>0.01</sub>O<sub>2</sub>) 328409-35-4, Cobalt iron lithium titanium  
 oxide (Co<sub>0.85</sub>Fe<sub>0.1</sub>Li<sub>0-1.2</sub>Ti<sub>0.05</sub>O<sub>2</sub>) 328409-36-5, Cobalt germanium iron  
 lithium oxide (Co<sub>0.7</sub>Ge<sub>0.2</sub>Fe<sub>0.1</sub>Li<sub>0-1.2</sub>O<sub>2</sub>) 328409-37-6, Cobalt germanium  
 iron lithium oxide (Co<sub>0.7</sub>Ge<sub>0.1</sub>Fe<sub>0.2</sub>Li<sub>0-1.2</sub>O<sub>2</sub>) 328409-38-7, Cobalt  
 germanium iron lithium oxide (Co<sub>0.7</sub>Ge<sub>0.05</sub>Fe<sub>0.25</sub>Li<sub>0-1.2</sub>O<sub>2</sub>) 328409-39-8,  
 Cobalt germanium iron lithium oxide (Co<sub>0.7</sub>Ge<sub>0.01</sub>Fe<sub>0.29</sub>Li<sub>0-1.2</sub>O<sub>2</sub>)  
 328409-40-1, Cobalt germanium iron lithium oxide (Co<sub>0.95</sub>Ge<sub>0.01</sub>Fe<sub>0.04</sub>Li<sub>0-1.2</sub>O<sub>2</sub>) 328409-41-2, Cobalt germanium iron lithium oxide

(Co<sub>0.85</sub>Ge<sub>0.05</sub>Fe<sub>0.1</sub>Li<sub>0-1.202</sub>) 328409-42-3 328409-43-4  
328409-44-5 328409-45-6

RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(compsn. and av. discharge voltage of substituted cobalt lithium oxide  
cathodes for secondary lithium batteries)

L10 ANSWER 13 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2001:83075 CAPLUS

DOCUMENT NUMBER: 134:149990

TITLE: O<sub>2</sub>-type Li<sub>2/3</sub>(Ni<sub>1/3</sub>Mn<sub>2/3</sub>)O<sub>2</sub> as cathode material for  
Li-ion batteries

AUTHOR(S): Shaju, K. M.; Rao, G. V. Subba; Chowdari, B. V. R.

CORPORATE SOURCE: Institute of Materials Research and Engineering,  
Singapore, 117602, Singapore

SOURCE: Solid State Ionics: Materials and Devices,  
[Proceedings of the Asian Conference], 7th, Fuzhou,  
China, Oct. 29-Nov. 4, 2000 (2000), 255-260.  
Editor(s): Chowdari, B. V. R.; Wang, Wenji. World  
Scientific Publishing Co. Pte. Ltd.: Singapore,  
Singapore.

CODEN: 69AWLC

DOCUMENT TYPE: Conference

LANGUAGE: English

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT 259190-87-9, Lithium manganese nickel oxide [Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.33</sub>O<sub>2</sub>]

RL: DEV (Device component use); PEP (Physical, engineering or chemical  
process); PROC (Process); USES (Uses)

(prepn. of O<sub>2</sub>-type Li<sub>2/3</sub>(Ni<sub>1/3</sub>Mn<sub>2/3</sub>)O<sub>2</sub> as cathode material for  
lithium-ion batteries)

L10 ANSWER 14 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2000:762625 CAPLUS

DOCUMENT NUMBER: 134:23712

TITLE: Superlattice Ordering of Mn, Ni, and Co in Layered  
Alkali Transition Metal Oxides with P<sub>2</sub>, P<sub>3</sub>, and O<sub>3</sub>  
Structures

AUTHOR(S): Lu, Zhonghua; Donaberger, R. A.; Dahn, J. R.

CORPORATE SOURCE: Department of Physics, Dalhousie University, Halifax,  
NS, B3H 3J5, Can.

SOURCE: Chemistry of Materials (2000), 12(12), 3583-3590

CODEN: CMATEX; ISSN: 0897-4756

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT 259190-87-9, Lithium manganese nickel oxide (Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.33</sub>O<sub>2</sub>)

285978-95-2, Manganese nickel sodium oxide (Mn<sub>0.67</sub>Ni<sub>0.33</sub>Na<sub>0.67</sub>O<sub>2</sub>)

285978-99-6, Cobalt lithium manganese nickel oxide

(Co<sub>0.17</sub>Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.17</sub>O<sub>2</sub>) 310450-15-8, Cobalt manganese nickel sodium

oxide (Co<sub>0.04</sub>Mn<sub>0.67</sub>Ni<sub>0.29</sub>Na<sub>0.67</sub>O<sub>2</sub>) 310450-16-9, Cobalt manganese nickel

sodium oxide (Co<sub>0.08</sub>Mn<sub>0.67</sub>Ni<sub>0.25</sub>Na<sub>0.67</sub>O<sub>2</sub>) 310450-17-0, Cobalt manganese

nickel sodium oxide (Co<sub>0.12</sub>Mn<sub>0.67</sub>Ni<sub>0.21</sub>Na<sub>0.67</sub>O<sub>2</sub>) 310450-18-1, Cobalt

manganese nickel sodium oxide (Co<sub>0.17</sub>Mn<sub>0.67</sub>Ni<sub>0.17</sub>Na<sub>0.67</sub>O<sub>2</sub>) 310450-19-2,

Cobalt manganese nickel sodium oxide (Co<sub>0.21</sub>Mn<sub>0.67</sub>Ni<sub>0.12</sub>Na<sub>0.67</sub>O<sub>2</sub>)

310450-20-5, Cobalt manganese nickel sodium oxide

(Co<sub>0.25</sub>Mn<sub>0.67</sub>Ni<sub>0.08</sub>Na<sub>0.67</sub>O<sub>2</sub>) 310450-21-6, Cobalt manganese nickel sodium

oxide (Co<sub>0.29</sub>Mn<sub>0.67</sub>Ni<sub>0.04</sub>Na<sub>0.67</sub>O<sub>2</sub>) 310450-22-7, Cobalt manganese sodium

oxide (CoMn<sub>2</sub>Na<sub>2</sub>O<sub>6</sub>) 310450-24-9, Cobalt lithium manganese nickel

oxide (Co<sub>0.04</sub>Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.29</sub>O<sub>2</sub>) 310450-26-1, Cobalt lithium

manganese nickel oxide (Co<sub>0.08</sub>Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.25</sub>O<sub>2</sub>) 310450-27-2,

Cobalt lithium manganese nickel oxide (Co<sub>0.12</sub>Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.21</sub>O<sub>2</sub>)

310450-28-3, Cobalt lithium manganese nickel oxide

(Co<sub>0.21</sub>Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.12</sub>O<sub>2</sub>) **310450-30-7**, Cobalt lithium  
manganese nickel oxide (Co<sub>0.25</sub>Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.08</sub>O<sub>2</sub>) **310450-31-8**,  
Cobalt lithium manganese nickel oxide (Co<sub>0.29</sub>Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.04</sub>O<sub>2</sub>)  
**310450-32-9**, Cobalt lithium manganese oxide (CoLi<sub>2</sub>Mn<sub>2</sub>O<sub>6</sub>)  
RL: PRP (Properties)  
(structure of)

L10 ANSWER 15 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2000:601230 CAPLUS

DOCUMENT NUMBER: 133:269362

TITLE: O2 structure Li<sub>2</sub>/3[Ni<sub>1</sub>/3Mn<sub>2</sub>/3]O<sub>2</sub>: a new layered  
cathode material for rechargeable lithium batteries.  
III. Ion exchange

AUTHOR(S): Paulsen, J. M.; Larcher, D.; Dahn, J. R.

CORPORATE SOURCE: Department of Physics, Dalhousie University, Halifax,  
NS, B3H 3J5, Can.

SOURCE: Journal of the Electrochemical Society (2000), 147(8),  
2862-2867

CODEN: JESOAN; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT **259190-87-9P**, Lithium Manganese nickel oxide Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.33</sub>O<sub>2</sub>

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)

(structure, compn. and properties of lithium nickel manganese oxide  
layered cathode material prepd. by ion exchange for rechargeable  
lithium batteries)

IT 12162-79-7P, Lithium manganese oxide limno<sub>2</sub> 12190-79-3P, Cobalt lithium  
oxide colio<sub>2</sub> 128975-24-6P, Lithium manganese nickel oxide LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>  
214536-41-1P, Cobalt lithium manganese oxide **297173-39-8P**,  
Lithium manganese nickel sodium oxide (Li<sub>0.33</sub>Mn<sub>0.67</sub>Ni<sub>0.33</sub>Na<sub>0.33</sub>O<sub>2</sub>)  
**297173-44-5P**, Iron lithium manganese oxide (Fe<sub>0.33</sub>Li<sub>0.67</sub>Mn<sub>0.67</sub>O<sub>2</sub>)  
297173-47-8P, Lithium magnesium manganese oxide (Li<sub>0.67</sub>Mg<sub>0.33</sub>Mn<sub>0.67</sub>O<sub>2</sub>)

RL: SPN (Synthetic preparation); PREP (Preparation)

(structure, compn. and properties of lithium nickel manganese oxide  
layered cathode material prepd. by ion exchange for rechargeable  
lithium batteries)

L10 ANSWER 16 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2000:504820 CAPLUS

DOCUMENT NUMBER: 133:122705

TITLE: O2-type Li<sub>2</sub>/3[Ni<sub>1</sub>/3Mn<sub>2</sub>/3]O<sub>2</sub>: a new layered cathode  
material for rechargeable lithium batteries. II.  
Structure, composition, and properties

AUTHOR(S): Paulsen, J. M.; Dahn, J. R.

CORPORATE SOURCE: Department of Physics, Dalhousie University, Halifax,  
NS, B3H 3J5, Can.

SOURCE: Journal of the Electrochemical Society (2000), 147(7),  
2478-2485

CODEN: JESOAN; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT 128975-24-6P, Lithium manganese nickel oxide LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>

**259190-87-9P**, Lithium manganese nickel oxide Li<sub>0.67</sub>Mn<sub>0.67</sub>Ni<sub>0.33</sub>O<sub>2</sub>

285978-95-2P, Manganese nickel sodium oxide (Mn<sub>0.67</sub>Ni<sub>0.33</sub>Na<sub>0.67</sub>O<sub>2</sub>)

**285978-96-3P**, Lithium manganese nickel oxide

(Li<sub>0.67</sub>Mn<sub>0.75</sub>Ni<sub>0.25</sub>O<sub>2</sub>) **285978-97-4P**, Lithium manganese nickel

oxide (Li<sub>0.67</sub>Mn<sub>0.7</sub>Ni<sub>0.3</sub>O<sub>2</sub>) **285978-99-6P**, Cobalt lithium

manganese nickel oxide ( $\text{Co}_{0.17}\text{Li}_{0.67}\text{Mn}_{0.67}\text{Ni}_{0.17}\text{O}_2$ ) 285979-02-4P  
, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.17}\text{Li}_{0.67}\text{Mn}_{0.58}\text{Ni}_{0.25}\text{O}_2$ )  
285979-03-5P, Manganese nickel sodium oxide ( $\text{Mn}_{0.5}\text{Ni}_{0.5}\text{NaO}_2$ )  
285979-04-6P, Manganese nickel sodium oxide ( $\text{Mn}_{0.56}\text{Ni}_{0.44}\text{Na}_{0.89}\text{O}_2$ )  
285979-05-7P, Manganese nickel sodium oxide ( $\text{Mn}_{0.61}\text{Ni}_{0.39}\text{Na}_{0.78}\text{O}_2$ )  
285979-07-9P, Manganese nickel sodium oxide ( $\text{Mn}_{0.67}\text{Ni}_{0.33}\text{NaO}_2$ )  
285979-09-1P, Manganese nickel sodium oxide ( $\text{Mn}_{0.67}\text{Ni}_{0.33}\text{Na}_{0.83}\text{O}_2$ )  
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic  
preparation); PREP (Preparation); USES (Uses)  
(structure, compn. and properties of lithium nickel manganese oxide  
layered cathode material for rechargeable lithium batteries)

L10 ANSWER 17 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2000:463585 CAPLUS

DOCUMENT NUMBER: 133:216796

TITLE: Layered T2-, O6-, O2-, and P2-Type  
 $\text{A}_{2/3}[\text{M}'_{2+1/3}\text{M}_{4+2/3}]\text{O}_2$  Bronzes, A = Li, Na; M' = Ni,  
Mg; M = Mn, Ti

AUTHOR(S): Paulsen, J. M.; Donaberger, R. A.; Dahn, J. R.

CORPORATE SOURCE: Department of Physics, Dalhousie University, Halifax,  
NS, B3H 3J5, Can.

SOURCE: Chemistry of Materials (2000), 12(8), 2257-2267

CODEN: CMATEX; ISSN: 0897-4756

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT 259190-87-9P, Lithium manganese nickel oxide  
( $\text{Li}_{0.67}\text{Mn}_{0.67}\text{Ni}_{0.33}\text{O}_2$ )

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(bronze; prepn. and crystal structure by x-ray and neutron diffraction)

L10 ANSWER 18 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2000:208961 CAPLUS

DOCUMENT NUMBER: 132:224770

TITLE: O2 structure  $\text{Li}_{2/3}[\text{Ni}_{1/3}\text{Mn}_{2/3}]\text{O}_2$ : a new layered  
cathode material for rechargeable lithium batteries.  
I. Electrochemical properties

AUTHOR(S): Paulsen, J. M.; Thomas, C. L.; Dahn, J. R.

CORPORATE SOURCE: Department of Physics, Dalhousie University, Halifax,  
NS, B3H 3J5, Can.

SOURCE: Journal of the Electrochemical Society (2000), 147(3),  
861-868

CODEN: JESOAN; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT 259190-87-9P, Lithium manganese nickel oxide  
( $\text{Li}_{0.67}\text{Mn}_{0.67}\text{Ni}_{0.33}\text{O}_2$ )

RL: DEV (Device component use); PRP (Properties); SPN (Synthetic  
preparation); PREP (Preparation); USES (Uses)  
(O2 structure lithium nickel manganese oxide layered cathode material  
for rechargeable lithium batteries)

L10 ANSWER 19 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1999:331189 CAPLUS

DOCUMENT NUMBER: 131:7572

TITLE: Manufacture of nickel mixed oxide and batteries with  
cathodes using it

INVENTOR(S): Arai, So; Sakurai, Yoji; Masayo, Takahisa; Yamaura,  
Junichi; Kondo, Shigeo; Tsutsumi, Shuji; Hasegawa,

PATENT ASSIGNEE(S): Masaki  
Nippon Telegraph and Telephone Corp., Japan;  
Matsushita Battery Industrial Co., Ltd.  
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| JP 11139830   | A2   | 19990525 | JP 1997-323880  | 19971110 |
| PRIORITY APPLN. INFO.:  |      |          | JP 1997-323880  | 19971110 |
| IT 176661-44-2P, Lithium nickel oxide (Li0.1NiO2) 176661-45-3P, Lithium nickel oxide (Li0.2NiO2) 225661-18-7P, Cobalt lithium nickel oxide (Co0.1Li0.2Ni0.9O2) 225661-21-2P, Lithium manganese nickel oxide (Li0.2Mn0.1Ni0.9O2) |      |          |                 |          |
| RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)   |      |          |                 |          |
| (nickel mixed oxide manufd. by acid treatment for cathodes in lithium batteries)  |      |          |                 |          |

L10 ANSWER 20 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1999:56858 CAPLUS  
DOCUMENT NUMBER: 130:156101  
TITLE: Secondary lithium batteries inhibiting lithium dendrite generation and electronic apparatus using the batteries  
INVENTOR(S): Ikgawa, Akiko; Tsuruoka, Shigeo; Takeuchi, Seiji; Yoshikawa, Masanori; Muranaka, Kiyoshi  
PATENT ASSIGNEE(S): Hitachi, Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| JP 11016571   | A2   | 19990122 | JP 1997-165588  | 19970623 |
| PRIORITY APPLN. INFO.:  |      |          | JP 1997-165588  | 19970623 |
| IT 220179-37-3, Cobalt lithium magnesium nickel oxide (Co0.3Li0.05-1.2Mg0.01Ni0.7O2) 220179-38-4, Cobalt lithium nickel oxide phosphate (Co0.3Li0.05-1.2Ni0.7O1.96(PO4)0.01) 220179-39-5, Cobalt lithium magnesium nickel oxide (Co0.2Li0.05-1.2Mg0.01Ni0.8O2) 220179-40-8, Cobalt lithium magnesium nickel oxide (Co0.1Li0.05-1.2Mg0.01Ni0.9O2) 220179-41-9, Cobalt lithium magnesium nickel oxide (Co0.1Li0.05-1.2Mg0.02Ni0.9O2) 220179-42-0, Cobalt lithium nickel oxide (Co0.1Li0.05-1.2Ni0.9O2) 220179-44-2 220179-45-3, Lithium magnesium manganese nickel oxide (Li0.05-1.2Mg0.01Mn0.3Ni0.7O2) 220179-46-4, Lithium manganese nickel oxide phosphate (Li0.05-1.2Mn0.3Ni0.7O1.96(PO4)0.01) 220179-47-5, Lithium magnesium manganese nickel oxide (Li0.05-1.2Mg0.01Mn0.2Ni0.8O2) 220179-48-6 220179-49-7, Lithium magnesium manganese nickel oxide (Li0.05-1.2Mg0.01Mn0.1Ni0.9O2) 220179-50-0, Lithium manganese nickel oxide (Li0.05-1.2Mn0.1Ni0.9O2) 220179-51-1, Aluminum lithium magnesium nickel oxide (Al0.3Li0.05-1.2Mg0.01Ni0.7O2) 220179-52-2, Aluminum lithium nickel oxide phosphate (Al0.3Li0.05-1.2Ni0.7O1.96(PO4)0.01) 220179-53-3, Aluminum lithium magnesium nickel oxide (Al0.2Li0.05-1.2Mg0.01Ni0.8O2) 220179-54-4 220179-55-5, Aluminum lithium magnesium nickel oxide (Al0.1Li0.05-1.2Mg0.01Ni0.9O2) 220179-56-6, Aluminum lithium nickel oxide (Al0.1Li0.05-1.2Ni0.9O2) |      |          |                 |          |



RL: DEV (Device component use); USES (Uses)  
(cathodes; secondary Li batteries using carbon anodes and alkali metal  
nickel oxide cathodes)

L10 ANSWER 21 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1998:596036 CAPLUS

DOCUMENT NUMBER: 129:205207

TITLE: Secondary lithium batteries with lithium and magnesium  
containing oxide cathodes

INVENTOR(S): Igawa, Akiko; Tsuruoka, Shigeo; Yoshikawa, Masanori;  
Muranaka, Kiyoshi; Komatsu, Yoshimi; Yamauchi, Shuko

PATENT ASSIGNEE(S): Hitachi, Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 25 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.   | KIND | DATE     | APPLICATION NO. | DATE     |
|--|------|----------|-----------------|----------|
| JP 10241691  | A2   | 19980911 | JP 1997-354358  | 19971224 |
| PRIORITY APPLN. INFO.:   |      |          | JP 1996-343041  | 19961224 |
| IT 212075-82-6P, Cobalt lithium magnesium nickel oxide (Co <sub>0.1</sub> LiMg <sub>0.01</sub> Ni <sub>0.90</sub> O <sub>2</sub> )           |      |          |                 |          |
| 212075-83-7P 212075-84-8P 212075-85-9P 212075-86-0P  |      |          |                 |          |
| 212075-87-1P 212075-88-2P 212075-89-3P 212075-90-6P  |      |          |                 |          |
| 212075-91-7P 212075-92-8P 212075-93-9P 212075-94-0P  |      |          |                 |          |
| 212075-95-1P, Copper iron lithium nickel oxide (Cu <sub>0.2</sub> Fe <sub>0.2</sub> Li <sub>0.1</sub> Ni <sub>0.60</sub> O <sub>2</sub> )    |      |          |                 |          |
| 212075-96-2P, Copper lithium manganese nickel oxide  |      |          |                 |          |
| (Cu <sub>0.15</sub> Li <sub>0.1</sub> Mn <sub>0.25</sub> Ni <sub>0.60</sub> O <sub>2</sub> ) 212075-97-3P 212075-98-4P                       |      |          |                 |          |
| 212075-99-5P 212076-00-1P 212076-01-2P   |      |          |                 |          |
| 212076-02-3P 212076-03-4P 212076-04-5P 212076-05-6P  |      |          |                 |          |
| 212076-06-7P 212076-07-8P 212076-08-9P   |      |          |                 |          |
| 212076-09-0P, Iron lithium magnesium nickel tin oxide (Fe <sub>0.2</sub> Li <sub>0.1</sub>   |      |          |                 |          |
| 1.2Mg <sub>0.02</sub> Ni <sub>0.7</sub> Sn <sub>0.10</sub> O <sub>2</sub> ) 212076-10-3P 212076-11-4P  |      |          |                 |          |
| 212076-12-5P 212076-13-6P 212076-14-7P 212076-15-8P  |      |          |                 |          |
| 212076-16-9P 212076-17-0P 212076-18-1P   |      |          |                 |          |
| 212076-19-2P 212076-20-5P 212076-21-6P   |      |          |                 |          |
| 212076-22-7P 212076-23-8P 212076-24-9P   |      |          |                 |          |
| 212076-25-0P, Aluminum cobalt lithium nickel oxide (Al <sub>0.1</sub> Co <sub>0.1</sub> Li <sub>0.1</sub>                                    |      |          |                 |          |
| 1.2Ni <sub>0.80</sub> O <sub>2</sub> ) 212076-26-1P, Aluminum cobalt lithium nickel tin oxide  |      |          |                 |          |
| (Al <sub>0.1</sub> Co <sub>0.1</sub> Li <sub>0.1</sub> 1.2Ni <sub>0.7</sub> Sn <sub>0.10</sub> O <sub>2</sub> ) 212076-27-2P, Cobalt lithium |      |          |                 |          |
| manganese nickel oxide (Co <sub>0.1</sub> Li <sub>0.1</sub> Mn <sub>0.1</sub> Ni <sub>0.80</sub> O <sub>2</sub> ) 212076-28-3P               |      |          |                 |          |
| 212076-29-4P 212076-30-7P 212076-31-8P 212076-32-9P 212076-33-0P   |      |          |                 |          |
| 212076-34-1P 212076-35-2P 212076-36-3P 212076-37-4P  |      |          |                 |          |
| 212076-38-5P 212076-39-6P 212076-40-9P 212076-41-0P  |      |          |                 |          |
| 212076-42-1P 212076-43-2P 212076-44-3P 212076-45-4P  |      |          |                 |          |
| 212076-46-5P 212076-47-6P 212076-48-7P 212076-49-8P  |      |          |                 |          |
| 212076-50-1P 212076-51-2P 212076-52-3P 212076-53-4P  |      |          |                 |          |
| 212076-54-5P 212076-55-6P 212076-56-7P   |      |          |                 |          |
| 212076-57-8P, Cobalt iron lithium magnesium tin oxide (Co <sub>0.7</sub> Fe <sub>0.2</sub> Li <sub>0.1</sub>                                 |      |          |                 |          |
| 1.2Mg <sub>0.01</sub> Sn <sub>0.10</sub> O <sub>2</sub> ) 212076-58-9P 212076-59-0P 212076-60-3P   |      |          |                 |          |
| 212076-61-4P 212076-62-5P 212076-63-6P 212076-64-7P 212076-65-8P   |      |          |                 |          |
| 212076-66-9P 212076-67-0P 212076-68-1P   |      |          |                 |          |
| 212076-69-2P 212076-70-5P 212076-71-6P   |      |          |                 |          |
| 212076-72-7P 212076-73-8P 212076-74-9P 212076-75-0P  |      |          |                 |          |
| 212076-76-1P 212076-77-2P 212076-78-3P   |      |          |                 |          |
| 212076-79-4P 212076-80-7P 212076-81-8P 212076-82-9P  |      |          |                 |          |
| 212076-83-0P 212076-84-1P, Copper iron lithium manganese   |      |          |                 |          |
| oxide (Cu <sub>0.2</sub> Fe <sub>0.2</sub> Li <sub>0.1</sub> Mn <sub>0.60</sub> O <sub>2</sub> ) 212076-85-2P                                |      |          |                 |          |
| 212076-86-3P 212076-87-4P 212076-88-5P   |      |          |                 |          |
| 212076-89-6P 212076-90-9P, Iron lithium manganese oxide  |      |          |                 |          |
| phosphate (Fe <sub>0.19</sub> Li <sub>0.1</sub> Mn <sub>0.80</sub> 1.96(PO <sub>4</sub> ) <sub>0.01</sub> ) 212076-91-0P                     |      |          |                 |          |
| 212076-92-1P 212076-93-2P 212076-94-3P   |      |          |                 |          |

212076-95-4P 212076-96-5P 212076-97-6P  
 212076-98-7P 212076-99-8P 212077-00-4P  
 212077-01-5P 212077-02-6P 212077-03-7P  
 212077-04-8P 212077-05-9P 212077-06-0P  
 212077-07-1P 212077-08-2P 212077-09-3P  
 212077-10-6P 212077-11-7P 212077-12-8P  
 212077-13-9P 212077-14-0P 212077-15-1P 212077-16-2P  
 212077-17-3P 212077-18-4P 212077-19-5P  
 212077-20-8P 212077-21-9P 212077-22-0P 212077-23-1P  
 212077-24-2P 212077-25-3P, Cobalt copper iron lithium oxide  
 (Co<sub>0.2</sub>Cu<sub>0.2</sub>Fe<sub>0.6</sub>Li<sub>0.1.202</sub>) 212077-26-4P, Copper iron lithium  
 manganese oxide (Cu<sub>0.2</sub>Fe<sub>0.6</sub>Li<sub>0.1.2Mn0.202</sub>) 212077-27-5P 212077-28-6P  
 212077-29-7P 212077-30-0P 212077-31-1P  
 212077-32-2P 212077-33-3P 212077-34-4P 212077-35-5P  
 212077-36-6P 212077-37-7P 212077-38-8P  
 212077-39-9P, Cobalt iron lithium magnesium tin oxide (Co<sub>0.2</sub>Fe<sub>0.7</sub>Li<sub>0.1.2Mg0.02Sn0.102</sub>) 212077-40-2P 212077-41-3P 212077-42-4P,  
 Iron lithium magnesium nickel tin oxide (Fe<sub>0.7</sub>Li<sub>0.1.2Mg0.01Ni0.2Sn0.102</sub>)  
 212077-43-5P, Cobalt indium iron lithium oxide (Co<sub>0.2</sub>In<sub>0.1</sub>Fe<sub>0.7</sub>Li<sub>0.1.202</sub>)  
 212077-44-6P 212077-45-7P 212077-46-8P 212077-47-9P  
 212077-48-0P 212077-49-1P 212077-50-4P  
 212077-51-5P 212077-52-6P 212077-53-7P  
 RL: DEV (Device component use); IMF (Industrial manufacture); PRP  
 (Properties); PREP (Preparation); USES (Uses)  
 (compsn. and properties of magnesium contg. lithium transition metal  
 oxide cathodes for secondary lithium batteries)

L10 ANSWER 22 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1998:505297 CAPLUS  
 DOCUMENT NUMBER: 129:191546  
 TITLE: Nonaqueous-electrolyte alkali metal secondary  
 batteries using alkali metal nickel mixed oxide boride  
 cathodes  
 INVENTOR(S): Ikawa, Akiko; Tsuoka, Shigeo; Komatsu, Yoshimi;  
 Yamauchi, Hisako; Yoshikawa, Masanori; Muranaka,  
 Kiyoshi  
 PATENT ASSIGNEE(S): Hitachi, Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

| PATENT NO.   | KIND | DATE        | APPLICATION NO. | DATE     |
|--|------|-------------|-----------------|----------|
| JP 10208743  | A2   | 19980807    | JP 1997-15031   | 19970129 |
| PRIORITY APPLN. INFO.:   |      |             | JP 1997-15031   | 19970129 |
| IT 211755-91-8, Cobalt lithium nickel borate oxide (Co <sub>0.3</sub> Li <sub>0.05-1.2Ni0.69(BO3)0.0101.97</sub> ) 211755-93-0, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> Li <sub>0.05-1.2Mn0.01Ni0.8901.99</sub> ) 211755-94-1 211755-96-3, Lithium manganese nickel borate oxide (Li <sub>0.05-1.2Mn0.3Ni0.69(BO3)0.0101.97</sub> ) 211755-98-5, Lithium magnesium manganese nickel oxide (Li <sub>0.05-1.2Mg0.01Mn0.1Ni0.8901.99</sub> ) 211755-99-6 |      |             |                 |          |
| 211756-01-3  |      | 211756-03-5 | 211756-05-7     |          |
| 211756-06-8  |      | 211756-07-9 | 211756-10-4     |          |
| RL: DEV (Device component use); USES (Uses)<br>(cathode active mass; nonaq.-electrolyte alkali metal secondary<br>batteries using alkali metal Ni Al mixed oxide cathodes)   |      |             |                 |          |

L10 ANSWER 23 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1998:414870 CAPLUS  
 DOCUMENT NUMBER: 129:97736  
 TITLE: Cathode active material for lithium batteries, and its

INVENTOR(S): manufacture  
Yasuda, Hideo  
PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan  
SOURCE: Eur. Pat. Appl., 10 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.   | KIND | DATE     | APPLICATION NO. | DATE     |
|--|------|----------|-----------------|----------|
| EP 849817  | A2   | 19980624 | EP 1997-122556  | 19971219 |
| EP 849817  | A3   | 19990324 |                 |          |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO  |      |          |                 |          |
| CN 1186351   | A    | 19980701 | CN 1997-121746  | 19971219 |
| JP 11213999  | A2   | 19990806 | JP 1997-365262  | 19971219 |
| US 5993998   | A    | 19991130 | US 1997-994326  | 19971219 |
| PRIORITY APPLN. INFO.:   |      |          | JP 1996-355280  | 19961220 |
|  |      |          | JP 1997-337961  | 19971121 |
| IT 177997-13-6, Aluminum cobalt lithium nickel oxide 182442-95-1, Cobalt lithium manganese nickel oxide 209667-93-6, Cobalt lithium nickel oxide ((Co,Ni)Li0.25-2O2) 209667-94-7, Lithium manganese nickel oxide (Li0.25-2(Mn,Ni)O2) 209667-95-8, Aluminum lithium nickel oxide ((Al,Ni)Li0.25-2O2) 209667-96-9, Lithium nickel oxide sulfide (Li0.25-2NiO-1O2S0-1) 209667-97-0, Cobalt lithium nickel oxide ((Co,Ni)Li1.4-2O2) 209667-98-1, Lithium manganese nickel oxide (Li1.4-2(Mn,Ni)O2) 209667-99-2, Aluminum lithium nickel oxide ((Al,Ni)Li1.4-2O2) 209668-00-8, Lithium nickel oxide sulfide (Li1.4-2NiO-1O2S0-1) 209668-01-9, Cobalt lithium nickel oxide (Co0.02-1.6Li0.25-2NiO-1O2) 209668-02-0, Cobalt lithium manganese nickel oxide (Co0.02-0.6Li0.25-2(Mn,Ni)O2) 209668-03-1, Aluminum cobalt lithium nickel oxide ((Al,Ni)Co0.02-0.6Li0.25-2O2) 209668-04-2, Cobalt lithium nickel oxide sulfide (Co0.02-0.6Li0.25-2NiO-1O2S0-1) |      |          |                 |          |
| RL: TEM (Technical or engineered material use); USES (Uses)<br>(cathode active material for lithium batteries and its manuf.)  |      |          |                 |          |

L10 ANSWER 24 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1998:275044 CAPLUS  
DOCUMENT NUMBER: 129:21455  
TITLE: Hematite-based oxide magnetic material and electrophotographic carrier from it  
INVENTOR(S): Tomosawa, Toshiaki; Mochizuki, Takeshi  
PATENT ASSIGNEE(S): Fuji Electrochemical Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.   | KIND | DATE     | APPLICATION NO. | DATE     |
|--|------|----------|-----------------|----------|
| JP 10116716  | A2   | 19980506 | JP 1996-270416  | 19961014 |
| PRIORITY APPLN. INFO.:   |      |          | JP 1996-270416  | 19961014 |
| IT 207801-14-7P, Iron lithium manganese carbonate oxide (Fe0.98Li0.1Mn0.46(CO3)0.05O1.93) 207801-15-8P, Iron lithium manganese carbonate oxide (Fe0.98Li0.4Mn0.31(CO3)0.2O1.78) 207801-16-9P, Iron lithium manganese carbonate oxide (Fe0.6Li0.4Mn0.5(CO3)0.2O1.4) 207801-17-0P, Iron lithium manganese carbonate oxide (Fe0.6Li0.1Mn0.65(CO3)0.05O1.55) 207801-18-1P, Iron lithium manganese carbonate oxide (Fe0.8Li0.3Mn0.45(CO3)0.15O1.65) |      |          |                 |          |

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(electrophotog. carrier from hematite-based oxide magnetic material)

L10 ANSWER 25 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1997:672771 CAPLUS  
DOCUMENT NUMBER: 127:334036  
TITLE: Electrochemical and thermal behavior of  $\text{LiNi}_{1-z}\text{MzO}_2$  (M = Co, Mn, Ti)  
AUTHOR(S): Arai, Hajime; Okada, Shigeto; Sakurai, Yoji; Yamaki, Jun-ichi  
CORPORATE SOURCE: NTT Integrated Information and Energy Systems Laboratories, Ibaraki, 319-11, Japan  
SOURCE: Journal of the Electrochemical Society (1997), 144(9), 3117-3125  
CODEN: JESOAN; ISSN: 0013-4651  
PUBLISHER: Electrochemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English

IT 12031-65-1, Lithium nickel oxide  $\text{LiNiO}_2$  116327-69-6, Cobalt lithium nickel oxide  $\text{Co}_{0.1}\text{LiNi}_{0.9}\text{O}_2$  149887-20-7, Lithium manganese nickel oxide  $\text{LiMn}_{0.1}\text{Ni}_{0.9}\text{O}_2$  150445-90-2, Lithium nickel oxide  $\text{Li}_{0.06}\text{NiO}_2$  163596-49-4, Lithium manganese nickel oxide  $\text{LiMn}_{0.2}\text{Ni}_{0.8}\text{O}_2$  163780-17-4, Lithium nickel oxide  $\text{Li}_{0.27}\text{NiO}_2$  185849-06-3, Cobalt lithium nickel oxide  $\text{Co}_{0.1}\text{Li}_{0.5}\text{Ni}_{0.9}\text{O}_2$  198065-49-5, Lithium nickel titanium oxide ( $\text{LiNi}_{0.9}\text{Ti}_{0.1}\text{O}_2$ ) 198065-50-8, Cobalt lithium nickel oxide ( $\text{Co}_{0.1}\text{Li}_{0.14}\text{Ni}_{0.9}\text{O}_2$ ) 198065-51-9, Lithium manganese nickel oxide ( $\text{Li}_{0.15}\text{Mn}_{0.1}\text{Ni}_{0.9}\text{O}_2$ ) 198065-52-0, Lithium manganese nickel oxide ( $\text{Li}_{0.16}\text{Mn}_{0.2}\text{Ni}_{0.8}\text{O}_2$ ) 198065-54-2, Lithium nickel titanium oxide ( $\text{Li}_{0.11}\text{Ni}_{0.9}\text{Ti}_{0.1}\text{O}_2$ ) 198065-55-3, Lithium manganese nickel oxide ( $\text{Li}_{0.5}\text{Mn}_{0.1}\text{Ni}_{0.9}\text{O}_2$ )  
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)  
(electrochem. and thermal behavior of  $\text{LiNi}_{1-z}\text{MzO}_2$  (M = Co, Mn, Ti))

L10 ANSWER 26 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1996:652472 CAPLUS  
DOCUMENT NUMBER: 125:291359  
TITLE: Copper nickel zinc ferrite magnetic material with high magnetic permeability  
INVENTOR(S): Inoe, Yasushi  
PATENT ASSIGNEE(S): Taiyo Yuden Kk, Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|-------------|------|----------|-----------------|----------|
| JP 08208233 | A2   | 19960813 | JP 1995-33155   | 19950130 |
| JP 3213192  | B2   | 20011002 |                 |          |

PRIORITY APPLN. INFO.: JP 1995-33155 19950130

IT 180638-38-4P, Copper iron nickel zinc oxide ( $\text{Cu}_{0.11}\text{Fe}_{0.92}\text{Ni}_{0.08}\text{Zn}_{0.35}\text{O}_{1.92}$ ) 180638-40-8P 180638-41-9P 180638-42-0P 180638-43-1P  
182693-03-4P, Copper iron molybdenum nickel zinc oxide ( $\text{Cu}_{0.14}\text{Fe}_{0.9}\text{Mo}_{0.01}\text{Ni}_{0.05}\text{Zn}_{0.34}\text{O}_{1.92}$ ) 182693-04-5P, Copper iron molybdenum nickel zinc oxide ( $\text{Cu}_{0.11}\text{Fe}_{0.98}\text{Mo}_{0.01}\text{Ni}_{0.08}\text{Zn}_{0.302}$ )  
182693-05-6P, Copper iron molybdenum nickel zinc oxide ( $\text{Cu}_{0.11}\text{Fe}_{0.99}\text{Mo}_{0.01}\text{Ni}_{0.06}\text{Zn}_{0.32}\text{O}_{2.01}$ ) 182693-06-7P, Copper iron molybdenum nickel zinc oxide ( $\text{Cu}_{0.05}\text{FeMo}_{0.01}\text{Ni}_{0.09}\text{Zn}_{0.34}\text{O}_{2.02}$ )  
182693-07-8P 182693-08-9P 182693-09-0P 182693-10-3P 182693-11-4P  
182693-12-5P 182693-13-6P

RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(copper nickel zinc ferrite magnetic material with high magnetic permeability)

L10 ANSWER 27 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1996:241802 CAPLUS  
DOCUMENT NUMBER: 124:294514  
TITLE: Nonaqueous-electrolyte secondary lithium batteries with improved cathodes  
INVENTOR(S): Watanabe, Shoichiro; Murai, Sukeyuki; Nitsuta, Yoshiaki; Sugimoto, Toyoji  
PATENT ASSIGNEE(S): Matsushita Electric Ind Co Ltd, Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|-------------|------|----------|-----------------|----------|
| JP 08031456 | A2   | 19960202 | JP 1994-162011  | 19940714 |
| JP 3168835  | B2   | 20010521 |                 |          |

PRIORITY APPLN. INFO.: JP 1994-162011 19940714  
IT 175897-07-1, Cobalt lithium oxide (CoLi<sub>0.05</sub>-1.1O<sub>2</sub>) 175897-08-2, Lithium nickel oxide (Li<sub>0.05</sub>-1.1NiO<sub>2</sub>) 175897-09-3, Iron lithium oxide (FeLi<sub>0.05</sub>-1.1O<sub>2</sub>) 175897-10-6, Lithium manganese oxide (Li<sub>0.05</sub>-1.1MnO<sub>2</sub>) 175897-11-7, Cobalt lithium nickel oxide (Co<sub>0.5</sub>Li<sub>0.5</sub>-1.1Ni<sub>0.5</sub>O<sub>2</sub>) 175897-12-8, Iron lithium nickel oxide (Fe<sub>0.5</sub>Li<sub>0.05</sub>-1.1Ni<sub>0.5</sub>O<sub>2</sub>) 175897-13-9, Iron lithium manganese oxide (Fe<sub>0.5</sub>Li<sub>0.05</sub>-1.1Mn<sub>0.5</sub>O<sub>2</sub>)  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(cathodes from oxidizer-contg. Li metal oxides for secondary Li batteries)

L10 ANSWER 28 OF 28 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1994:683581 CAPLUS  
DOCUMENT NUMBER: 121:283581  
TITLE: Secondary nonaqueous batteries with lithium manganese nickel oxide cathodes  
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PATENT ASSIGNEE(S): Matsushita Electric Ind Co Ltd, Japan  
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| JP 06203829 | A2   | 19940722 | JP 1992-284836  | 19921023 |
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IT 159101-58-3, Lithium manganese nickel oxide (Li<sub>1</sub>-1.6Mn<sub>0.4</sub>-1Ni<sub>0</sub>-0.6O<sub>2</sub>) 159101-59-4, Lithium manganese nickel oxide (Li<sub>0.4</sub>-1Mn<sub>0.4</sub>-1Ni<sub>0</sub>-0.6O<sub>2</sub>)  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(secondary nonaq. batteries with cathodes composed of lithium manganese nickel oxide of different cryst. structures)